BLUEBOOK

SEPTEMBER 1942



AILLING

MACHINE

Angle head h.p. motor andle No. 9 wn & Sharpe

brret Head brated 360

zontal spindle

Table feed seedwontrol

ower feed

peed control

pr. horizontal sindle—3 h.p. (in bose)



Ram cross travel-10"

Horizontal spindle Nat. standard No. 40 taper

Table working surface 917 x 36

Cross travel 9"

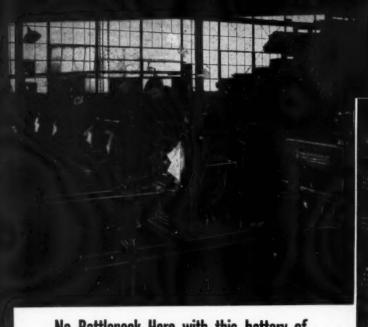




Write for literature

FRAY MACHINE TOOL COMPANY

sol w windows a Clandala Falifarnia



No Bottleneck Here with this battery of high speed automatic MARVEL Hack Saws

This battery of high speed MARVEL No. 9A Hack Saws, with automatic bar push-up, has solved the cutting-off problem of R. G. LeTourneau, Inc., Peoria, III.

Placed at the open end of the stock racks, they are used to cut-off single lengths or large numbers of identical pieces from ½* to 6* round bars, ¼* flats in widths to 10*, and billets from 2* to 10* square. Built for continuous heavy duty operation, all-ball-bearing and exceedingly fast, they have kept pace with the rapidly expanding production at the immense LaTourneau plant.

After more than 4 years of practically continuous night-and-day operation, Foreman R. C. Langhals, sums it up with: "Very little trouble and good work." And, to that should be added: Faster than any sawing machines or other cutting-off method and extremely accurate — the most economical and efficient cutting-off tools available.

ARMSTRONG-BLUM MFG. CO.

5700 Bloomingdale Ave. Chicago, U. S. A.
Eastern Sales Office: 225 Lafayette St., New York





Spring tempered COLLETS

RIVETT LATHE & GRINDER



HARDINGE Second Operation Machines

mean

Extreme Accuracy, High Spindle Speeds and Ease of Operation

Extreme accuracy, high spindle speeds and ease of operation a have multiplied many times the importance of Hardinge High Speed Precision Second Operation Machines.

This combination means greater accuracy and better finish under the close tolerances of manufacturing standards both today and is the days to come. The ease and simplicity of operation enables relatively unskilled operators to produce parts to the necessary close limits without expensive tooling.

formance has established leadership for HARDINGE"

CAPACITY:

Vie" to 1" with collets
1" to 6" with step churks

1" to 6" with step chucks 1" to 5" with jaw chucks Spindlo Speeds: 230 to 3900 R.P.M.

HARDINGE BROTHERS INC., ELMIRA, N.Y., U.S.A.

ARMSTRONG



The first job more than pays for an ARMSTRONG Boring Tool

A single boring or inside threading job will often pay for an ARMSTRONG Boring Tool in setting-up time alone, for it is all tools in one. With a few cutter bits, any mechanic can quickly grind from stock, shapes of high speed steel, and its 3 interchangeable Bar End Caps which hold cutters at 300, 450 or 900 it will do the work of a complete set of boring and inside threading tools. "Tool changes" can be made without even removing the ARMSTRONG Boring Tool from the tool post. A half turn of a set screw permits the adjustment of the bar, permits the stiffest possible bar cut at every point. End caps are instantly interchangeable for changing of cutter or cutting angle making possible the most convenient and efficient tool for each stage of the work.

End costly delays and increase machine output by equipping every lathe with an ARMSTRONG Boring Tool. They are instantly available from stock at your nearest supply house.

ARMSTRONG BROS, TOOL CO.

"The Tool Holder People"

308 N. Francisce Ave. Chicage, U.S.

Eastern Warehouse and Sales: 199 LAFAYETTE ST., NEW YORK



Machine Tool Blue Book

Hitchcock Publishing Co., 508 So. Dearborn St., Chicago

35,000 This Issue

Volume 38, No. 9

SEPTEMBER 1942

Featured in This Issue	61
Editor's Page	
Grinding Wheel Fundamentals	
Producing 30 and 50 Caliber Cartridge Case Carbides	
The Foremanship Forum	105
Personality Traits of a Good Foreman By Edmund Mottershead	
Aspects of Modern Milling(Part 2) By John E. Hyler	
Wet Versus Dry Grinding	145
Modernizing with New Drives By Francis A. Westbrook, M. E.	157
Tipped Versus Solid Tools By Leo J. St. Clair	
Overmotoring Hampers War Effort	179
Burn Another Inch—Build Another Ship	187
Cowl Ventilator Production	193
"Let's Talk Shop"	207
"Tooling Up" for Victory	223
Keep'Em Running	332
Plants for Sub-Contract Work	
Mechanics Through the Ages	
BLUE BOOK Buyers' Service	
Index to Advertisers	400-403



Acceptance under the Act of June 5, 1934, authorized February 12, 1941



R. C. Van Kampen, President J. E. Hitcheock, Vice President M. L. Yonts, Secretary & Prod. Mgr. Wesley G. Paulson, Editor C. E. Elringa, Circulation Mgr. Representatives
W. E. Hoffman, Portland, Conn.
A. E. Wailes, S5 W. 42nd St., N. Y. C.
D. B. Trott, 2187 Olive Ave., Lakewood, Ohio.
R. H. Deibler, 2461 Sleepy Hollow Drive, Glendale, Cal.
Hichard J. Ferncase, 508 S. Dearborn St., Chicago, Ill.

(Copyright 1942, by Hitchcock Publishing Co., Chicago, Ill.)
Phone: HARrison 6040
Cable Address: HITCHPUB



Were Nicainor Kendall pulled his rifle from under the robe of his sleigh, the hammer under the robe of his sleigh, the hammer of his property of the state of the

JONES





Jones & Lamson Automatic Thread Grinder Model TG-615.









strove for safety

and achieved simplicity

THE underhammer rifle that Kendall first designed has long been superseded by faster, more accurate, more powerful weapons. The mechanical principles by which Nicainor Kendall worked have long been the common property of progressive engineers.

But leadership in the application of those principles did not die with Nicamor Kendall. Nor did it die with men like Robbins, Howe, Hilliard and Hartness, whose successors are responsible for the most recent advances in Jones & Lamson machine tool technique.

As a result of these advances, modern Jones & Lamson machine tools, optical

comparators and threading tools embody numerous unique advantages.

In Jones & Lamson machine tools, these advantages are apparent, not only in refinement and ease of operation, but in ample reserves of speed, rigidity and useful power, enabling you to make the fullest possible use of each new development of hard alloy cutting tools. Thus you can speed war time production and be prepared to meet the keen competition of a post-war world.

Write today to Jones & Lamson engineers regarding your production problems. Inquiries from large plants or small receive prompt and thorough study here.

LAMSON MACHINE COMPANY

SPRINGFIELD, VT., U. S. A.



Jones & Lamson Automatic Internal Thread Grinder

Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automode Lethes . . . Automatic Thread Crinding Machines . . . Comparators . . . Assemble Opening Threading Discount Change.



PROFIT PRODUCING







AUTOMATIC OFFICE

HYDRAULIC CONTROL
AND
FEEDING
MECHANISMS
FOR MACHINE TOOLS

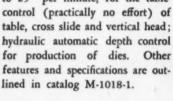
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED
CINCINNATI OHIO U.S.A.

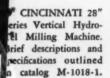
• Ask for publication No. M-1001

TOOL BOOM AND MANUFACTURING MILLING MACHINES .. SURFACE REPARMING MACHINE

THE booklet illustrated at the left (publication No. M-1001) will not cure all the hydraulic ills of all the machine tools in your shop, but it will give you a more thorough understanding of hydraulics. Thusly fortified, you will feel more sure of helping yourself when hydraulic troubles develop. More important, there will be fewer production delays traceable to hydraulics, for you will be less inclined to overlook the simple and easy-to-follow routine required for the continuous operation of hydraulically powered equipment.

The booklet consist of a number of articles written by our research engineers . . . men intimately acquainted with the theory and application of hydraulics. The CINCINNATI Vertical Hydro-Tel Milling Machine, for example, was conceived in our Research Laboratory. Outstanding hydraulic features include: independent and non-related feeds, infinitely variable from 1" to 25" per minute, for the table and cross slide; hand Servo









UNSURPASSED FOR RAPID, ECONOMICAL PRECISION SAWING

Whether it's special parts or regular production work—20 to 80 stacked sheets, bar or tubing stock, blocks of any thickness—the DoAll saves uncountable man hours and much valuable machine time.

DoAll supremacy is aided by the 48 different saw bands available—a best style for every

kind of metal or alloy.

Then, consider the metal saved—very important today. DoAll leaves waste metal in large, usable pieces, not in a heap of filings or nibbled chips.





NO FINISHING IS NECESSARY

That's right—on the DoAll you can cut out thousands of metal parts and they're all ready for use. Follow the line of any external or internal design and get a smooth finish that requires no further machining.

New Illustrated Book—The story of DoAll performance in many plants, told in pictures. Send for copy.

CONTINENTAL MACHINES, Inc.

1300 S. Washington Ave.

Minneapolis, Minn.

Associated with the DeAll Company, DesPlaines, III.

Manufacturers of Band Saws and Band Files for DoAll Contour Machines

THE EXACT SIZE FOR YOUR JOB







Index 05000 Under 02500 Under 02000 Under 01500 Holler 12000



The recently announced Logan Turret Lathe was developed to supply the demand for a durable small hand screw machine capable of accurate, continuous production. Small parts made from bar stock of %" diameter and less can be turned out with the same speed and precision as that of larger machines and thus release the latter for heavier work. Built to rigid and exacting specifications and the same high standards as the other lathes in the Logan Line.



The Logan Bar Feed is offered as an accessory for the No. 830 Hand Screw Machine. Maximum capac, ity 34° round stack. Maximum stroke 2° Patented safety cam action locks collet and operates bar feed.

LOGAN ENGINEERING COMPANY . Chicago, Illinois



LATHES NAME TO REMEMBER WHEN YOU



KEEP 'EM CUTTING . . AND SAVE THE PIECES

IN this war, machine tools on the average are cutting away steel at a rate more than 12 times faster than in 1918. That's production keep them cutting!

Keep them cutting faster by selecting tool steels more closely suited to the job. Case after case in our files show increases in feeds, speeds, or pieces per grind—increases, often, of 50% and more—when the eight tool steel went to work. Keep them cutting constantly by knowing the best alternate tool steel for each job. Know it, and know its performance, as insurance against a time when your firstchoice steel may be short in supply.

And save the pieces! Every particle of steel, especially High Speed Steel, is important, and much critical alloy material can be saved for re-use if peoper methods of reclamation and classification are employed. Let

our Service Staff help with your problems of tool steel selection, treatment, use and salvage.





Heat Treating Experience

THIS FAR!







Unassisted, experience cannot be spread. Much as necessity may soon demand, experience can't be divided up and passed around.

But, if some day soon, you do find it necessary to "spread" the experience of your most valuable heat treater, Upton Electric Salt Bath Furnaces will help accomplish it.

That's because Upton furnaces require less specific specialized knowledge for satisfactory performance and the best results. They are faster and yet virtually foolproof in every type of heat treating operation. They automatically protect the surface of the metals being treated—excluding all air from the work and even providing a protective coating after the work is removed.

Temperature control—especially in portant in the high heat furnaces is semi-automatic and so close cathe temperatures be held that absolute prediction of size change can made. Finish-grinding is reduced

... up to 2500°F

Upton Electric Salt Bath Furnac are available for almost any her treating operation up to 2500°F ar for almost any type of heat treating And, pots are guaranteed.

. . . sloping rear wall

This design in a furnace means more unimare means more unimare form distribution of heat. Important in any work, but especially so on large pieces. No superheating of salts. Less "fuel" required.



We have solved some unusual problems. Send us yours, now!

UPTON ELECTRIC FURNACE DIVISION

Commerce Pattern Foundry & Machine Company

We build the lume

nneiple of operation



READY FOR ACTION

Jarvis Power Tools as used in the manufacture of engines, propellers, planes, ship and instruments have done their part.

THE CHARLES L. JARVIS CO., MIDDLETOWN, CONN.

TAPPING ATTACHMENTS . FLEXIBLE SHAFT MACHINES . GROUND ROTARY FILES

Simplifying

COMPLICATED BENDING JOBS

FOR AIRCRAFT PRODUCTION





The aircraft industry is today relying on Buffalo Aircraft Type Bending Rolls to maintain all types of bending assignments on a fast production basis. Designed with exceptional simplicity of control and a wide range of speed.

Buffalo Aircraft Type Bending Rolls are efficient allies in the aircraft "Battle of Production".

BUFFALO FORGE COMPANY

161 MORTIMER ST. BUFFALO, N. Y.

GANADIAN BLOWER & FORGE CO., LTD., RITCHENER, ONT.





BENDING ROLLS





LAMPS OF JAPAN"

THE Rotor Analyst and his cohorts, AIR
and HIGH-CYCLE O'Tool recommend

this formula for "taking care" of the Axis:

Take care of your AIR and HIGH-CYCLE tools to keep 'em running! . . . AIR tools, for example:

Oil and grease them properly, regularly.

Eliminate moisture from air lines.

Keep air strainer, blades, and governor "In the pink."
Start new tools properly.

Know what to do when tools lose power.

Observe portable tool Safety Rules.

To help you keep 'em running, we have published a booklet giving maintenance pointers for AIR grinders, drills, etc. Applicable also to other makes of tools. The same information, in condensed form, is available in an attractive wall chart for handy reference in the shop. Call the Rotor Analyst or write us for your free copies today.

This attractive wall chart, 18" x 24" gives maintenance tips for Air tools. More detailed information in booklet form. Both free on request. Similar guides also are available for High-Cycle Tools.

ROTOR TOOL

HIGH

YOUR AIR TOOLS

NORTON SERVICE



ENGINEERING



Evr Victory Production

Local Distributors to Help You Out of the Tight Spots

Over 160 Norton distributors the country over are aiding the war industries—are ready with grinding wheels on their shelves to meet local needs. Backing them are Norton warehouses in five strategic industrial centers and the Worcester factory stock rooms with over 2,000,000 wheels in some 100,000 combinations.

Engineering Service for the New Grinding Jobs

New grinding problems arise every day as plants change speedily from regular products to war products. But 1800 distributors' representatives, co-operating with Norton field men and factory specialists, are ready to help find the answer. At their command is the wealth of data on grinding in the war industries compiled at Worcester—sent in by Norton field men everywhere for mutual use.

Research Facilities for the Tough Grinding Problems

The Norton research staff has over 50 trained scientists and technicians. A major duty today is to aid the Norton engineering force in solving many of the more difficult grinding problems that new war production jobs have brought. Extensive tests are carried out in both the field and the laboratories to determine the proper wheels and the correct grinding procedure.



NORTON COMPANY WORCESTER, MASS.

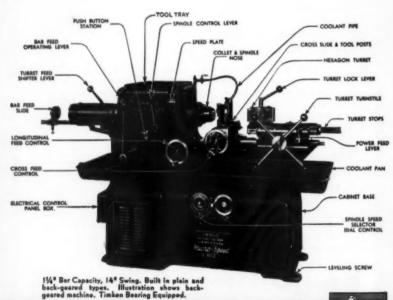
The Navy "E" flies over the Norton Plants
W-868

NORTON ABRASIVES

EASE OF OPERATION MEANS .



- * MICRO-SPEED DRIVE
- * SELECTOR DIAL CONTROL
- * SPINDLE BRAKE AND CLUTCH







HIGHER PRECISION ... Faster!



LIGHT Simmons Turret Lathes at work in the plant of Swift Lubricator Company, producing aircraft bushings held to .0005", reamed to .001" and held to length within .005". Thousands each day! That's what we mean by "Higher Precision . . . Faster!"

Designed for simplicity of operation, with a minimum of confusing devices, these Simmons Turret Lathes make it easy for even inexperienced operators to produce high-precision work quickly. For example, the Micro-Speed Drive offers unlimited speed variations and all changes can be made while the spindle is in operation. This enables quick selection of the speed best-suited to the work and cutting tools. A simple oversize brake brings the spindle to rest quickly.

Write today for descriptive bulletin and complete specifications.

Our delivery schedule is reasonably quick.

SIMMONS MACHINE TOOL CORPORATION
Main Office: 1725 N. BROADWAY, ALBANY, N.Y. New York Office: 140 BROADWAY



Wherever metal War Products must be cleaned or finished, MALL Geared Head Grinders will do the job faster, more efficiently - at lower cost.

These powerful grinders are easily wheeled anywhere in the shop, can be operated from any regular electrical outlet and operate independently of all other tools. Every r. p. m. in the heavy-duty, 3 phase, 220 -440-volt, inclosed, dust and vapor proof motor is stepped up in the working tool assuring constant high torque for the toughest grinding jobs. The light weight working tools are easy to handle... can be changed as quickly and simply as bits in a brace and kept within reach on tool tray beneath the motor.

MALL Geared Head Grinders with easter base or hanger bail mountings and interchangeable tools for Grinding, Disc, Cone and Drum Sanding, Wire Brushing, Polishing, Buffing and Drilling are available for VICTORY PRODUCTION.

MALL FLEXIBLE SHAFTS For Remote Control and

Dependable Flexible Shafts and Metallic or Rubberized Fahric Housings can be furnished for every Aircraft, Automotive or Industrial application in any length or type. Let our engineering staff assist you with your requirements.

Write, wire or telephone for full details.

"THROW YOUR SCRAP INTO THE FIGHT"

MALL TOOL COMPANY

7742 South Chicago Ave.,

Chicago, III.

More Efficient Tapping at Lower Cost . . .

Here's why Procunier Tapping Heads give This to you

> The exclusive advanced design of the new Procunier Tapping Heads assures you accurate tapping at high speeds with automatic protection for taps! Tap is driven by a double-cone, cork-faced friction clutch which automatically regulates tap driving power by pressure applied through the drill press spindle. Operators can quickly detect dull or loaded taps by the "feel," or pressure on the clutch, required to drive them thus avoiding needless tap breakage. With this sensitive Procunier smooth-operating friction clutch, bottom tapping is as simple as through tapping, since the clutch in-

stantly slips should the tap strike bottom or stick due to the tap loading.

External Threading

Standard Procunier Tapping Heads can be equipped for external threading. Produce accurate work and increase output. SEND FOR BULLETIN giving full details, degiving full details, de-scription and prices on complete line of Pro-cunier Precision Tapping Heads to meet all needs. The new Tru-Grip Tap Holder—and also the full line of Procunier Univer-sal Tapping Machines, hand or foot operated.

Procumier Safety Chuck Co. 14 S. Clinton St. Chicago, Illinois

Send me bulletine on:

High Speed Tapping Heads Tru-Grip Tap Holders Universal Tapping Machines. Name.... Address.

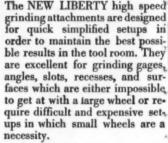
PROCUN

SAFETY CHUCK CO.

CHICAGO, ILLINOIS

LASER

VERTICAL HIGH SPEED GRINDING
ATTACHMENT



Designed for the most accurate service in grinding tools are various kinds of mechanical equipment.

SEND FOR CIRCULAR GIVING FULL DETAILS.

LIBERTY TOOL AND GAGE WORKS

USE IT FOR DOZENS OF JOBS LIKE THESE!

MITERING BEVELING TRUE-SURFACING FINISHING COM-

BRRINUG SQUARING

peed

med

Ssi-

hey

ges,

ble re-

e a

ite

IG

in

POUND ANGLES & IRREGULAR SURFACES

PORTER-CABLE

WET-DRY BELT SURFACER

Sets New Speed-Quality
Records On Production Lines, Toolroom Jobs!

You'll be amazed at the efficient versatility of this new belt-machining method—you'd think it was made specially for each operation | Because of speed and easy adjustability, many plants now use these Porter-Cable machines in assembly line groups for doing successive surfacing operations. Because of accuracy as close as .0005, and true flatness, they do many fussy toolroom jobs with sizable time-savings.

Belt surfacing helps relieve work-swamped shapers, millers, planers, grinders—it often eliminates fixtures and jigs. You can use this method either wet or dry, on hard or soft metals, plastics, wood, ceramics, glass. The belt itself can be turned horizontally or vertically—its rest-table and slotted cross-quide are adjustable up to 45°. Get the full facts in our new booklet showing many time, money and man saving applications of Wet-Dry Belt Surfacing. Sent free—write us today!



Write for literature and prices

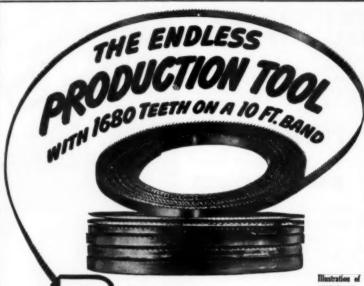
PORTER-CABLE MACHINE CO.

PUT NEW LIFE IN IN YOUR OLD MILLER!

Porter-Cable Milling Machine Attachments convert old standard machines into accurate, adaptable millers suited to many intricate operations . . . all in a brief 3 minutes! Unequalled for experimental and toolroom jobs. You'll want to give one of these attachments a tryout if you need to

Mill compound angles
Spot face on a bevel
Sink a horizontal keyway
Mill a T-Slot
Cut an internal or external cam
Contour radii or angles

300-9 Exchange St., Syracuse, N. Y.



ROALL BAND SAWS

The continuous cutting ability of DoAll Contour Saws is a real production feature. 25,000 separate teeth contact the work every minute when a 10-foot DoAll band travels at the rate of 150 f.p.m. The constant chip producing capacity makes this the fastest machining method of slicing off metal ever devised.

IF YOU HAVE A TOUGH MACHINING JOB-

One that has you stumped—send it to our Research Laboratory, the only place of its kind, for free analysis. Our experts will make tests and submit a detailed report showing you how to do the work in the quickest, easiest manner.

EASY TO HANDLE

Each 100-ft. coil comes in a strong metal box, through the slot of which any desired saw length can be drawn and cut off.

FREE-32-page book on DoAll Rand Saw Performance

THE DOALL COMPANY

1206 Thacker St.,

Des Plaines, III.

Associated with Continental Machines, Inc., Minneapolis, Minn.



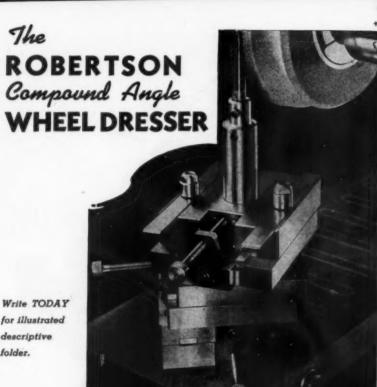


Because your War Work can't wait, Covel is in continuous production on this No.15 Hand Feed Surface Grinder. Ideal for quick set-ups where hand feed control gives desired flexibility. These features, plus low initial cost, make this accurate machine a natural addition to your production line or tool room.

NOW—PROMPT DELIVERIES
TO WAR PRODUCTION
PLANTS.

Write, wire or phone for Bulletin MT92, and name of nearest dealer.





descriptive folder.

saves precious man-hours in production,

This precision instrument is playing a vital, important part in America's all-out war effort speeding-up production, by saving both time and money.

With the Robertson Compound-angle Wheel Dresser, a machine operator can dress an included angle tangent-to-radius from 00 up to and including 1800 at one setting, thus eliminating the old method of "trial and error" dressing.



PRECISION CYLINDERS

give you <u>better</u> use of hydraulic power

Hannifin hydraulic cylinders have the advanced design and precision construction that provides high efficiency use of hydraulic power, with simplest application.

Mirror finish homing of the cylinder bore, even in the largest sizes, produces a straight, round, perfectly smooth cylinder interior. This means high efficiency piston seal, minimum fluid slip, long life, and greatest useful power. No-tis-rod design allows removal of end caps without collapse of other parts, and permits independent positioning of end caps for convenience in installation.



Hanniin hydraulic cylinders are built in seven standard mounting types, with small diameter piston rod, 2 to 1 differential piston rod, or double end piston rod, with or without edjustable cushion. All sises, any length of a troke, for working pressures up to 1000 and 1500 lbs. sq. in. Special types built to order. Write for Bullatin 35-H giving complete specifications.

HANNIFIN MANUFACTURING COMPANY 621-631 S. Kolmar Ava., Chicago

HANNIFIN

CYLINDERS



NUCUT "WAYY TEETH" magnified show exclusive patented design a assures faster, easier, smoother file

Wavy rows of cutting keenness...



filing at the double quick!

Patented NUCUT "Wavy Teeth" cut clean, level smooth... both at the same stroke!

Up against quickly filing aluminum bars, castings, sheets, without clogging or chattering? Or finishing shafts of stainless steel? Or speeding any one of the countless other filing jobs to meet urgent war-production requirements?

Then choose a NUCUT - of the correct type, size,

shape and cut for the work you have to do. Take advantage of NUCUT'S patented "Wavy Teeth" design – that means more, better, faster filing with less effort. That combines the clean, deep cutting of coarse teeth with the smooth surface-finishing of fine teeth. Both at the same stroke!

Your mill supply house will tell you the particular styles and sizes to best meet your needs!

HELLER BROTHERS COMPANY
America's Oldess File Manufacturers
Newark, N. J. Newcomerstown, Ohio



HELLER NUCUT WAVY TEETH

FILES

PATENT No 2027019



A battery of Atlas Latbes equipped for screw machine operations helps meet delivery schedules on a wide variety of precision airplane control units. There is one sure way to by-pass the screw machine shortage on small parts production use Atlas 10" Lathes with turrets and collet chuck. Equipment cost is low. Atlas Lathes have the rigidity and

accuracy for today's precision tolerances and can take round-the-clock production runs month after month. We hope every manufacturer faced with shortages in screw machine and turning production will investigate the possibilities of Atlas Lathes. Atlas Press Company, 950 N. Pitcher St., Kalamazoo, Michigan,



H pr

Ci

P

OTHER ATLAS EQUIPMENT FOR WAR PRODUCTION



MACHINES

Compact, powerful beach millers for full range of milling work.

SHAPERS

Handle all work within a T'' atroke accurately, quickly,

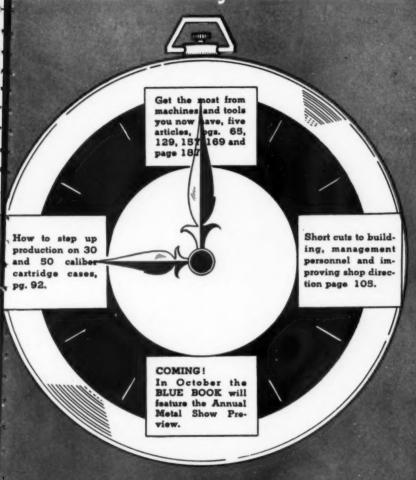


DRILLING

Step up production on smallhole drilling, tapping, 4, 3, 2spindle models,



IR "*Round The Clock"* PRODUCTION Sure To Read These Timely Articles in This Issue.



YOUR TOOLS AND THE AXIS



These ACCURATE GAUGE TOOLS are standard in Industrial Plants

Each STURTEVANT TORQUE WRENCH is an accurate gauge tool that measures torque within exacting limits and retains its remarkable accuracy permanently. Today Sturtevant wrenches are used throughout industry to present distortion or overstressing of vital stude, bolts, or screws and by accurately measuring frictional drag in products ranging from deligate instruments to heavy war tanks. They are used to insure uniform tensioning in exampling of airplane engines and automobile motors are vital tools in the building of modern gun mechanisms and batterings. Sturtevant Torque Wrenches are standard wherever the last to be accurately measured or controlled.



a Course the or enemy thing the think set to

TECH L

If you are between graphing problem STURTEV. WRENCHES the solution quiry or read sheets will attention.

ITY Pour aneutly Accurate TORQUE WRENCH

NO

FRICTION ADJUSTMENTS MOVING PARTS FRAGILE MECHANISMS

The Sturtevant Line of Torque Wrenches provides accurate gauging wrenches in capacities from a few inch pounds (as used by instrument makers) to great two handled wrenches of 7200 lb. capacity. All embody the same basic design, without wearing, moving or fragile parts. All are permanently accurate, even under abusive treatment, hence require no corrective or compensating adjustments or fragile resetting devices. That is why in vital defense plants and wherever absolute dependability and accuracy are essential, STURTEVANT TORQUE WRENCHES are

PA. STURTEVANT CO. ADDISON QUALITY ILLINOIS

ave Time and steel with tools of

PRO

Pla up. Bre all

Boring Worm Gear Housinga typical job for MO-MAX.

The urgency of the emergency demands the utmost of every man, machine and minute. To get utmost production in metal cutting, use tools made of MO-MAX. They stay sharp-20% longer between grinds than 18-4-1. REX TMO

Thousands of tons of MO-MAX used during the past decade prove this steel is today's clear answer to the call for more production with less use of strategic materials. MO-MAX depends only on the STA U.S.A. for its moly and its less than two percent MO.TUNG of tungsten. Its one percent of vanadium is the VOI-MO lowest of any commercial high speed steel.

To its high red hardness, toughness, weldability and heat treatability, add availability. Fourteen leading steel makers can supply you. They are listed on this page. Write any of them or us for complete technical data. The Cleveland Twist Drill Company, Cleveland, Ohio.

MOHICAN

BETHLEHEM HM

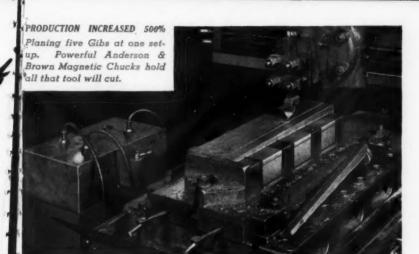
Mo-cur STAR MAX

MOUTE #

REX IMO

DI-MOI

TATMO



NOW—Super-Power Magnetic Chucks for Your Shapers and Planers!

Intense Holding Power and Flexibility
of Anderson & Brown Magnetic
Chucks Cut Your Production Costs

● The photo shows only one of the many time-saving applications of this remarkable new-type chuck. Utilizing the principle of "Magnetic Body Flo," this method of holding work goes far beyond the limitations of conventional magnetic chucks, providing power and adaptability not heretofore possible.

On all types of surface grinders, as well as planers and shapers... in the tool room and on the production line... hundreds of shops are now enjoying the amazing advantages of ANDERSON & BROWN Magnetic Chucks.

ILLUSTRATED CIRCULAR - FREE

Learn more about how this magnetic chuck can save you time and money! Write for your copy of 'Magnetic Chucking Revolutionized''.



ELIMINATES COSTLY FIXTURES

The above jigs and several operations were eliminated from the job illustrated at top of page. Why not save the cost of fixtures and speed up your production with ANDERSON & BROWN Magnetic Chucks?

ANDERSON & BROWN CO.

2034 East 22nd Street Cleveland Ohio

KIRK & BLUM

Dust Control Systems

help industry maintain peak production

Now, more than ever, industry must be free of all shackles—especially dust-laden air. Nothing should interfere with the effort for greater production.

That's why a large war production plant, making machine tools, recently installed this Kirk & Blum Dust Control System in its enlarged pattern shop.



This entire new system, to clear the air of dust and collect shavings, was installed without interfering with machinery set-up and without loss of production time.

An interesting feature of this installation is the location of the shavings and sawdust storage bin between two buildings to permit truck passage for gravity loading.

Kirk & Blum Dust Control Systems are doing similar jobs—effectively and economically—in many war and civilian industries.

Men, machines and materials are protected from dust. Working conditions are improved and costs are reduced.

Why not consult Kirk & Blum Engineering Staff today? A survey of your plant can be made, without obligation, and recommendations submitted for your consideration.

Send for any of the following booklets:

"Blower Systems for Woodworking Plants"

"Dust Collecting Systems in Metal Industries"

"Fan Systems for Various Industries"

"Industrial Ovens"

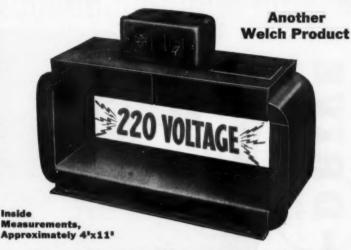
"Cooling Systems for the Glass Industry" "Data on Kirk & Blum Production Facilities"

THE KIRK & BLUM MANUFACTURING CO.
2834 SPRING GROVE AVE. CINCINNATIONIO

Welch

QUICK DEMAGNETIZER

Operates 220 VOLTAGE A.C. 60 Cycle



One Pass Does the Job!

This new outstanding unit is necessary wherever magnetic chucks are used. Operating on 220 voltage, any ordinary sized pieces . . . cutters, gears, washers, etc. . . . can be demagnetized by only a single pass through its powerful field. This means a decided saving in time. The Welch Quick Demagnetizer can be easily connected in any handy location in your plant by your own electrician. It is equipped with a convenient switch. CARRIED IN STOCK FOR IMMEDIATE DELIVERY. (Should your power be other than 220 volt, 60 cycle, kindly inform us.)

10 DAYS FREE TRIAL If Desired

Price \$120.00

Write for particulars

INDUSTRIES, INCORPORATED

Makers of High Speed Milling Cutters-Form Tools and Special Tools 20000 WEST EIGHT MILE RD. DETROIT, MICHIGAN



SOME USERS OF

URNER UNI-DRIVE

American Brake Shoe & F. Co.

Sectric Auto-Lite Co. Driver Harris Co.

issouri Pacific I

allivan Dry Dock Co. Vabash Railway Co.

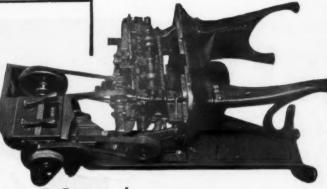
SEPTEMBER 1942

E TOUGHEST, FASTEST,

BOX DRIVE MOST EFFICIENT A Man Can Ask For: GEAR

crease production like an extra shift . . . save time . . . production . . . you must have them to keep apace! Enlist the aid of TURNER UNI-DRIVES. They'll inspeed up work . . . keep down power costs. They're doing it in scores of shops and plants. They'll do it in yours. The old way is too slow today. More speed . . . greater TURNER UNI-DRIVE is the successful motor drive.

at all speeds. One trial will thoroughly convince you. Right now-today...investigate TURNER UNI-DRIVE. Easily and quickly installed. They do away with overhead counter shifts ... no belts to shift. Increase the efficiency of machine and operator. Drive on large cone See your dealer, or write or wire us for full information. THE TURNER UNI-DRIVE COMPANY
(Sales Division Turner Machinery Company)



For Lethes, Milling Machines, Shapers, Turret Lathes, Radial Drilli, Soring Mills, Hobbing Machines and various machine tools... siso Brown & Sharpe and Cleveland Autometic Screw Machines.

Kansas City, Mo.

3416 Terrace St.



"Thompson" with the 3 way circular swing is used efficiently for milling punches, end mills, key ways, counterbores or the manufacture of duplicate parts.

AUTO-ORDNANCE CORPORATION

THOMPSON 437 RAILROAD AVE.



DIVISION

BRIDGEPORT, CONN.



For threading, the "Willard" produces smooth, accurate threads close to shoulder — no fitting

to gauge when grinding - no adjustment in tool post after grinding.

Forming tools inserted in the "Willard" produce faster, smoother machining — free from cutter marks.

Ratchet design prevents cutter from turning under heavy feeds — holder key prevents side sway — fewer rejects. Specify Willard Spring Tool Holders and efficiently speed up the war effort.

AUTO-ORDNANCE CORPORATION

1437 RAILROAD AVE



DIVISION

BRIDGEPORT, CONN.

SHELDON Back Geared Screw Cutting PRECISION LATHES



FOR THE TOOL ROOM

The finest 10', 11' and 12' lathes ever built in the moderate price field. special analysis steel spindles ground all over, with extra collet capacity. Hand scraped Bronze Ultra-Precision Ball or Super-Precision Roller



Spindle bearings (the finest bearings obtainable). Heavy braced, semi-steel beds with hand scraped ways (2 V-ways and 2 flat ways). These lathes come with a choice of aprons, gear boxes, and drives including the anti-friction base motor drive illustrated. Telescopic Taper Attachment and other accessories available.



FOR PRODUCTION

Sheldon Lathes will stand up to any production work within their capacity-are ideal for second operation work. Production models available with any or all of these features: Ultra-Precision Ball or Super-Precision Roller spindle bearings. Lever-operated Collet Attachment, Lever-operated Tailstock, Lever-operated cross slide with double tool post, Leveroperated turret, etc.



FOR MACHINE SHOP

Both Bench and Floor models with choice of Semi-quick or Full-Quick Change Gears, Plain Aprons or Worm Feed Apron with Power Cross Feed, Overhead, Back or Underneath Motor Drives-Telescopic Taper Attachments, Tool Post Grinders, Milling Attachments and all standard accessories. Also a full line of Arbor Presses and milling machine Drill Press and Shaper Vises.

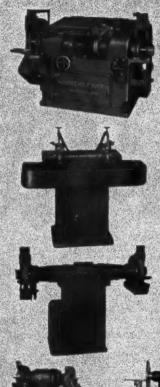


WRITE FOR CATALOG

Just out "The Care and Operation of a Lathe" to help apprentice training. 50c list price, discounts for quantity purchases.

SHELDON MACHINE CO. INC. CHICAGO, U.S.A. 4242 N. KNOX AVE..

Sure! All Kinds



Wet Grinders and Dry Grinders
Drill Grinders and Disc Grinders
Grinders with extra wide
wheel spacing
Bench Grinders and Pedestal
Grinders
Lathe Grinders and Center Grinders
Grinders for snagging or tools
Large Grinders and Small Grinders
High Speed or Low Speed

tool room.

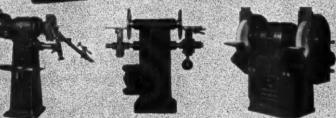
Hisey Catalog No. 60CH lists more than 200 different types and sizes of Grinders from 1/4 to 25 H.P. capacity.

Grinders for production or

Write for it now.

Also a complete line of Buffing and Polishing Machines in direct drive and V belt drive models.

THE HISEY-WOLF MACHINE CO.





An All-Purpose Cut-Off Machine For

IRON & STEEL BRASS & COPPER ALUMINUM & ZINC WOOD & PLYWOOD BUILDER'S BOARDS BRAKE LINING CASTING SPRUES ASBESTOS & RUBBER PIPE . FIBER PAPER . PLASTICS

Or Other Tough Industrial Materials

SPECIFICATIONS

Throat depth—13½". Under Guide Clear-ance—5½" Blades, width—½" to ½" wids; length—98". 8-Speed Gear Box Drive—92, 128, 193, 250, 1650, 2420, 3260, 4100 ft. per minute. Micrometer Set Blade Guides with New type Jaws. Height—67". Floor Space—27½"x29"; Weight—365 lbs. Model shown \$214.80, F.O.B. Factory, with ½h.p., 1 ph. motor. Blade Weider for inside cut-ting, \$90.

For Toolroom or Production

The Boice-Crane is designed for use anywhere in the plant. Stands the gruelling pace of production line or foundry. Meets exacting tool-room needs.

Makes straight, angular and contour cuts. Beats milling machine and shaper time roughing out dies, cams, punches, and odd-shaped assembly parts.

Write Div. E for Literature Today!

BOICE-CRANE CO. TOLEDO, OHIO

UP TO THE MINUTE...

Chicago Steel Brakes Are Modern in Design and Sturdy Construction



Forms boxes or pans from one piece of metal. A straight brake as well as a box brake. Ideal for experimental shops.



Efficient and dependable _
eturdy and durable.



building STEEL CONSTRUCTED sheet metal working machines are behind each CHICAGO BRAKE. They're built to give years of service.

ALL CHICAGO BRAKES are built of rolled steel worlded sections which insure great strength, accuracy and long life. They are the most modern tools in design and workmenship to fit today's need for feet production sheet metal working machinery.

We Are The World's Largest Manufacturers Of Hand Bonding, Power Bonding And Power Press Brakes.

Aside from the CHKAGO line, we have built many special machines for intricate bending operations. Take advantage of our many years' experience by sending us any difficult bending problem you have.

DREIS & KRUMP MFG. CO.



POWER BENDING BRAKE-

Indispensable wherever a volume of heavy plate work is done—forms a great variety of bends and shapes



PORMING PARTIES PARTIE SMALL PRESS BRAKE-

Compact, powerful money-earing production unit. Replaces cumbersome costly machines that are expensive to operate. Uses same dies as larger machines. LARGE PRESS BRAKE-

The only pross brake which turns out perfect work without shims and crowned diss Patented non-deflecting hed equalizes presours over the full bending length and over comes major fault in solid hed press brakes



A tool that saves time is a great contribution to the safety of this nation. A tool that saves money is a safeguard against non-profit and loss to your shop. R and L is just such a tool.

Speed is the keynote of this vast defense production schedule. This Turning Tool increases production by reducing set-up time, by speeding up cutting, by doing right and left hand turning (it requires only ten seconds to change from a right to a left hand turning tool), and by performing several operations simultaneously.

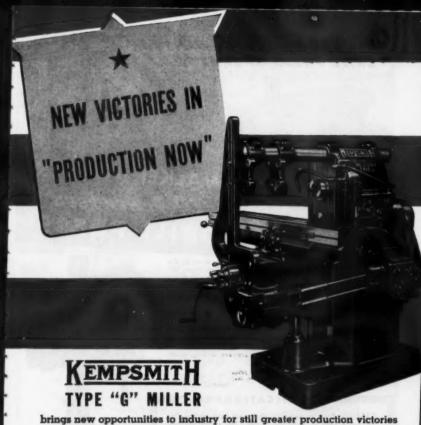
A savings of over \$200 is realized on the initial cost alone. R and L costs less than one-fourth of the tool which it replaces (14 in all). And, because they are simply and ruggedly built, they retain their accuracy, thereby saving maintenance costs. It does away with the reconditioning of extra tools when worn, or replacing when lost.

Write for booklet describing this and Tap and Die Holder, Roller Backrest and Universal Tool Post.

R and L Tools

1827 Bristol St.,

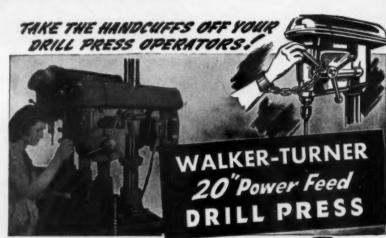
Nicetown, Phila., Pa.



brings new opportunities to industry for still greater production victories ... victories assured by Kempsmith's 54 years' engineering experience and cooperation in production now for the immediate war program... victories that result from new power and speed, convenience and economy, plus precision and stamina for 24-hour days. 7 days a week! KEMPSMITH Type "G" Miller and the famous KEMPSMITH MAXIMILLER ... plain or universal . . . are built to meet industry's needs of today and tomorrow!

CERCHINOTH TYPE G





Don't handcuff your operators by making them look down on the food levers of hand-food drill presses. The new Walker-Turner 20" Power Food Drill Press is Ideal for production drilling operations because:

- It is designed to standards of occuracy found heretofore only in much higher priced machines.
- 2) Large scale production methods make possible its low price -(\$255 up).
- 3) It is obtainable in multiple spindle models, up to six spindles.
- Simple, streamlined design makes it easy for unskilled labor to operate with very little instruction.
- It handles all of the usual drill press operations, drilling; reaming, tapping and counterboring.

With for Standard and prince Walter-Toron Company, Inc., 1792 Bardson Street, Philippi

SPECIFICATIONS I

CAPACITY: Drills to center of 30" circle. Feed 6". Drills up to 1" in cast iron, 34" in steel. Feeding speeds, 303", ,006", A09", .012" per spindle revolution. Spindle speeds, 260-13200 r.p.m.

One piece hand casting, line hered. Ten spline spindle, with four precision hell bearings. Pulley mounted between two bell bearings to prevent whip. One shet lubrication. No. 2 Morse Taper. Many ether features.



WALKER-TURNER MACHINE TOOLS

DRILL PRESSES - BEND SAWS - BENCH SAWS - TILTING ARBOR SAWS - LATHES JIG SAWS - RADIAL SAWS - RADIAL DRILLS - BELF AND DISC SUPFACERS - DINTERS SPINGLE SHAPERS - GENDERS - FLYEBLE SHAFF MAGISHES - CUSTOM BUILT MOTOR!

METAL SAWING- Streamlined



JOHNSON CUT-OFF BAND SAW

Plant production men working on "impossible" completion schedules know and appreciate the Johnson Saw. Set-ups require only a minute or two, cutting action is fast and continuous. Unlimited adaptability and flexibility for handling almost all kinds of cutting. 3-point base makes special flooring unnecessary.



JOHNSON MANUFACTURING CORP.

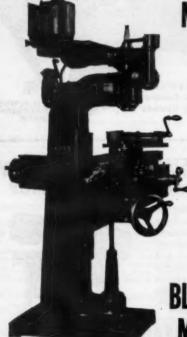
Write today for descriptive folder to:

Sales office: 5000-04 CHRYSLER BLDG., NEW YORK

** 40-H INDEX **

MANUFACTURED BY INDEX MACHINE & TOOL CO.

A GOOD HIGH SPEED VERTICAL MILLER PLUS



It has a spindle running in super precision ball bearings and equipped with No. 9 Brown & Sharpe taper.

It will mill with end mills 1/8" to 1/8" in tool steel, will bore a 3" hole in steel with a fly cutter and has verniers for locating. Area capacity 8"x16" at one setting.

Users in hundreds of defense plants say it is the outstanding machine of its class.

Sole Distributors

BLANK AND BUXTON MACHINERY CO.

3100 E. Michigan Ave., Jackson, Mich.



ene as FAST as ...



THE HANDWHEEL and the ram eds to the work by fast mechan-action instead of slow, laborious raulic pumping.



PLIP THE BALL ARM to close the valve instead of slowly turning a hand-wheel type control.



START PUMPING and immediately get tons of pressure on the work becau the bydraulic cylinder was autor ically filled with oil during oper. No. 1.

With Time so terribly short, every econd saved in any operation adds reatly to our War effort. The builth Speed of KRW Presses is as Fast. nd simple, as A B C. KRW Hydraulic Arbor Presses are fast bringing the am to the work...fast in developing aydraulic pressure ... fast in raising he ram to remove the work. Another

time and labor saving KRW feature is the stationary bed adjustment control...no matter where you move the bed, the ratchet control crank remains at convenient operating height. Write for bulletin describing 25, 50 and 75 ton presses . . . priced from \$198.00*.

*Prices F.O.B. Areada, N.Y. Slightly higher west of Rockies

K. R. WILSON

LOCK ST., BUFFALO, N. Y., U. S. PORT OFFICE: 90 WEST ST., NEW YORK, N.Y., U.S. A.

Osborne Mach. Co., Son Francisco, Colif., U. S. Smith-Booth Usher Co., Los Angeles, Colif., U. S.

MAIL THIS COUPON

K.R. Wilson, 27 Lock St., Buffalo, N.Y. Please send Hydraulic Arbor Press Bulletin No. 27.

Name Address ... City.....

State.

Fulflo Pumps and Valves



Fulfla COOLANT PUMPS

insure constant pumping. The centrifugal pumping action

maintains that continuous outward whirl of the coolant fluid which is undisturbed by chips or grit.

Sizes %" to 11/2".

With motor, direct or belt drives, right or left rotation. Regular or special models.

Model PRSA is shown here

FULFLO

PRODUCTS

When time and production schedules won't stand for "ifs, ands or buts" you can depend on these to do a man's size job on your own products or on what you are fabricating.

Fulfla BY-PASS VALVES

Standard valves in pipe sizes from ½" to 2"; pressures from 0 to 350 lbs-Cast iron or brass bodies

> with brass, hardened or stainless steel pistons.

Flanged valves in sizes 1" to 2"; with 300-lb. American standard flanges.

Piston type . . . Non-chattering.

Write for data and mechanical drawings.







Specialties Co., Inc.

LESS SET-UP TIME



MEANS MORE

Production

FROM EVERY GRINDER

With the Robbins Magna-Sine your set-up time on either single or compound angular grinding jobs can be reduced from hours to minutes. When this saving in time is multiplied by the number of jobs on each grinder, the result means a considerable increase in the productive capacity of your grinding department.

Equally as important as the time saving feature of the Magna-Sine is its absolute accuracy. The Magna-Sine uses the gage block method of determining angles, and the precision construction of the Magna-Sine

makes the angle just as accurate as the standard gage block that is used.

A Magna-Sine should be available for every grinder on which an average volume of angular grinding work is done. It is available in two sizes in both compound and single angle models.

Write for complete information today.

The MAGNA-SINE



The Magna-Sine is also available in a non-magnetic model for the accurate inspection of angular machining work. The non-magnetic model is built on the same principle and to the same close limits as the magnetic model.

ROBBINS ENGINEERING COMPANY

218 MIDI AND AVENUE

DETROIT, MICHIGAN

Something really NEW in Surface Grinders!



and all specifications on

this new DELTA-Mil-wankee Toolmaker surface Grinder. Get in touch with nearest Delta Industrial Distributor or mail coupon direct to Delta Mfg, Co. Superior Features in Design and

Improved, well-designed spindle-made extra-long with bearing at either end.

Special Wheel Mounting System-utilizes two-piece adapter so that either wheel, or wheel and adapter, can be removed. Thus, once wheel has been trued up, wheel and adapter can be removed and replaced without need of re-dres-

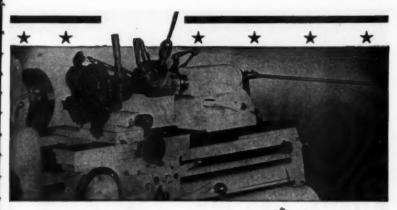
Improved Table - smooth operating, with conveniently located control handles—has long ways so that table never "hangs" over end of machine.

Specifications

Maximum length that can be ground—13½; maximum width that can be ground—6; maximum space under 7* wheel to table—9½; maximum space under 7* wheel to be \$5 No. 510 Magnetic chuck—6*; Table surface \$3½*x12*.

The Delta Manufacturing Co, 604-K E. Vienna Ave., Milwaukee, Wis. Gentlemen: Please send me special bulletin on the new DELTA-Milwaukee Toolmaker Surface Grinder giving full specifications and prices.

Name Addres		
City	State	



Convert YOUR ENGINE LATHE INTO A TURRET LATHE IN 15 SECONDS



Yes it's as easy as that ! You simply attach the Jefferson Tail Stock Turret, the Jefferson Tool Post Turret, and the Jefferson Adjustable Pull Feed to your lather as shown in illustration.

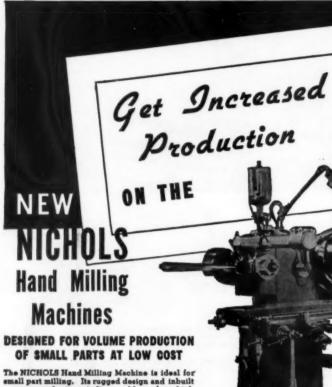
The productive capacity of these machines will be more than doubled in many instances because there will be available at all times NIME DIFFERENT TOOLS.

With these three JEFFERSON time-saving devices attached to a lathe, any kind of work may be done, such as forming, roughing, boring, finishing, knurling, drilling, tapping, etc., without stopping the lathe or changing tools. The JEFFERSON TURRETS are made very substantial, rigid, accurate and to fit small bench lathes up to 24° swing.

DELIVERY IN 15 DAYS Write for further details, also literature on the Jefferson Precision Milling Machine, Milling Machine Dividing Heads, Vises, Swing Frame Grinder, Endless Belt Sander, Foundry Riddle.



JEFFERSON MACHINE TOOL CO.



accuracy make it an indispensable modern, high production tool. Its high precision and speedy set-up permits you to take full advantage of high cutting speeds.

May we send you illustrated bulletin:

SPECIFICATIONS

Longitudinal feed, 10°. Transverse feed 7°. Vertical feeds of knee, 131/2". Vertical movement of head, 41/4". Micrometer dials on Transverse and Vertical feeds. Spindle speeds 100, 200, 600 and 1200 r. p. m.

H. NICHOLS & SONS MASS., U. S. A.

NUPLA PLASTIC HAMMERS

SAVE TIME AND MONEY

In Machinery Assembling-

In Metal Forming-

In Machine Shops-



NUPLA hammers are made of "Cryst-O-Flex", a semi-soft plastic, invented and manufactured exclusively by New Plastic Corporation. They are unexcelled for machine shop purposes, machinery assembly work, and metal forming (dural, aluminum, brass, bronze, etc.)

ADVANTAGES

- 1. NUPLA HAMMERS neither mar nor cut metal or other materials.
- 2. NUPLA HAMMERS prevent "pile up" of materials.
- 3. NUPLA HAMMERS do not sting or vibrate in heavy use, thereby reducing fatigue to a minimum.
- 4. NUPLA HAMMERS have exceptional durability.
- 5. NUPLA HAMMERS are not affected by gasoline, oil, etc.

TWO HARDNESS GRADES:

Grade A-General Machine Shop Use.

Grade B-Hardened Cryst-O-Flex for Metal Forming.

WEIGHTS

8 oz. 17 oz. 5 oz.

8 oz

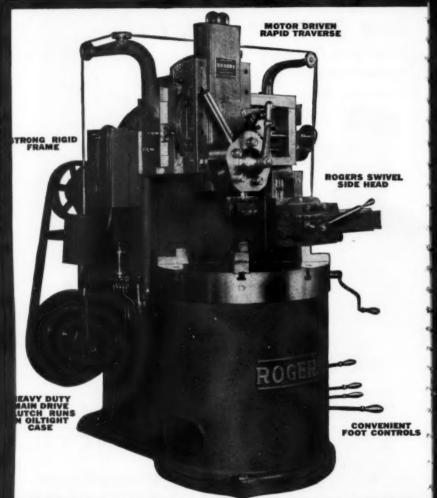
NEW PLASTIC Corporation

1017 No. Sycamore Ave.,

Los Angeles, Calif.

15 oz. 24 oz. 2 lbs.

SINCE 1885



EATURES

36" diameter capacity.

Side head sets at any angle up to 35 degrees each side of vertical.

Table face to terret face 23" max. to

Rapid traverse en mein heod.

Box type main and side head rail with saddle, swivel and tool stake.

6%" diameter spindle with 175 sq. in. V-shaped bearing 14%" in diameter.

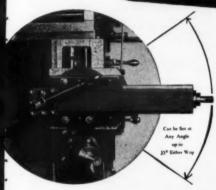
ROGERS has known how

VERTICAL TURRET MILLS

ARE MAKING SURPRISINGLY

QUICK DELIVERIES AT REAL

ATTRACTIVE PRICES



ROGERS SPECIAL DESIGNED SWIVEL SIDE HEAD

Universal adaptability of Regers
"perfect 36" Vertical Turret Mills
is further increased by the Regers
Swivel Side Head. This new development permits the side head to
opment permits the side head to
the set at any angle each side of
the set at any angle each side of
the set at setting for irregular
tate tool setting for irregular
shaped pieces.

Snapes Built-in graduated dial saves time in making set-ups for original and second runs. 57 years of new developments and engineering achievements is the background of every Rogers Vertical Turret Mill delivered, installed and put into operation. These many years of accumulative experience in cooperation with the metal working industry has been climaxed by the Rogers "Perfect 36" Vertical Turret Mills (36" capacity).

Level chuck, special swivel side head, 5 position main turret, square side turret, rapid traverse, provide quicker set-ups... more finished work per hour . . . closer tolerances in a minimum amount of operator's time and subsequent reduction of mill "down time."

For faster, more accurate boring, drilling and turning large ferrous and non-ferrous castings, forgings and similar pieces, call on Rogers today and tomorrow to "Machine It on the Level."

Remember, Rogers is making surprisingly quick deliveries at very attractive prices.

Knowing How Since 1885

ROGERS MACHINE WORKS IN

FACTORY: ALFRED, N. Y

Announcing THE IMPROVED 1/4 INCH

SKILDRIL

- · RUNS QUIETER
- . STAYS COOLER
- . DRILLS HOLES FASTER!

If you've seen SKILDRILL or heard about the thousands of SKILDRILLS in war plants, you know it's perfect for easy, topspeed, day-long drilling. And now you should know that SKILDRILL has been improved...with new special features that put it even farther

ahead of every other 1/4-indrill in the market! We improved the gear-

ing . . . made SKILDRILL run quieter than ever without adding an ounce to its easy-handling 2¾ lbs.!

We stepped up the cooling system... made this cool drill run COOLER without making it bigger (only 2%s in. wide and 6% in. long). And we offer SKLIDBILL in 4 SPEEDS to give you peak performance on whatever material you use... to speed up every production drilling job in your plant. Ask your distributor to demonstrate new, improved SKLIDBILL teday!

SKILSAW, INC. 5835 Elston Ave., Chicago

Brut York - Botton - Buffulo - Piricadolphia - Cloveland - Debuilt bulincapalis - B. Louis - Kencon City - Adamta - New Orleans

SKILSAW PRINTED TOOLS

MAKE AMERICA'S HANDS MORE PRODUCTIVE *

EVERY MAN

COUNTS FOR MORE

USING SKILSAW TOOLS!

THESE SPECIAL FEATURES

- a Hew Culoter, Smeather Gearing's a Hew Improved Cealing System!
- e 4 Speeds Available! For festest drilling on any mater

For feelest drilling on any 1900 R.P.M. 2500 R.P.M. 2500 R.P.M. 5000 R.P.M.

32°

Jeatured In This Issue

Expert grinding machine operators already know how to care for grinding wheels. But many newly trained operators and apprentices may not comprehend the "why" of all the "do's and don'ts." R. A. Reed of the Norton Company endeavors to set them right in his current offering on "Grinding Wheel Fundamentals." See page65

Conservation of cutting tools is essential to our war effort because many of them are made of strategic mate"Lets Talk Shop" is the regular shop notes section, presenting a variety of hints, tips and suggestions on page 207

"Tooling Up for Victory" offers this month, a new line of Jones and Lamson Turret Lathes, a Foote-Burt Rifling Machine for 30 and 50 caliber rifles description of the new Vonnegut Armor Plate Grinder, and many other timely new features. See page223

"Mechanics Through the Ages" Blue Book's exclusive picture page324

Plants available for Subcontract Work333

HOW TO GET THE MOST OUT OF YOUR LATHES

No. 1 in a series of suggestions made by the South Bend Lathe Works in the interest of more efficient war production.

Keep Your Lathes Clean

Yes, it's as simple as that. Keep your lathes clean and you increase production, reduce scrap, and lengthen the life of your equipment.

This will not only benefit you, but it will also be a definite contribution to our total war effort.

Dirt is Abrasive

The scale, grit and fine chips produced by the cutting tool mix with the oil on the bed ways, dovetails and other bearing surfaces, forming a

dirty sludge. Because this dirt is abrasive, it increases friction and causes wear wherever it is allowed to collect.

A small paint brush is convenient for brushing away loose dirt and chips. Compressed air is not so good because it may blow dirt and chips into oil holes and bearings. A clean cloth can be used, after brushing, to remove the last traces of dust and grit. A little oil on the cloth will prevent rust from forming on the finished surfaces.

The felt wipers on the ends of the aaddle wings should be removed and cleaned in kerosene occasionally. An experienced machine tool service man should periodically inspect the lathe and remove any grit or chips that may have worked under the saddle or tailstock. The bed ways can be badly



A small paint brush is convenient for brushing away dirt and chips

scored by a small steel chip imbedded in the saddle or tailstock base.

Don't Let Chips Collect

Adequate chip disposal should be provided to prevent chips from piling up underneath or around the lathe.

Now, when most machine tools are operating 24 hours a day, a small amount of carelessness may cause excessive wear — even a breakdown. Certainly an ounce of prevention is now worth far more than a pound of cure.

Write for Bulletin H1

Bulletin H1 giving more detailed information on the cleaning and care of the lathe will be supplied on request. Reprints of all advertisements in this series can also be furnished.



SOUTH BEND LATHE WORKS

Dant. 191

South Bend, Ind., U. S. A.

Lathe Builders for 35 Years

as The Editor Sees It

"Nobody's goin' to slow me down . . . or make me give up drivin' over to watch the ponies on my off day!"

"Why should I give up another cup of coffee . . . or another spoonful of sugar?"

"They'd better not put any price ceilings on me. It's my turn now!"

Cracks like these, and others make you wonder what it takes to jolt some people into realizing that we are at war . . . in a desperate struggle for our very existence, which until recently has been going against us.

Our boys are dying on farflung battle fronts. Subject peoples are being methodically exterminated by starvation. Entire villages have been wiped out in savage reprisals for the lives of Nazi gangsters.

It can't happen here? It will happen unless all of us do some realistic thinking and acting. Too many of us are too soft. We've parked too long on overstuffed cushions. We feel entitled to ride here, there and everywhere on rubber . . . with all the trimmings. And the day may not be far distant when all of us must learn to shoot guns or make 'em.

The Axis seeks to control our economic existence (slavery) and to throttle the minds and souls of subject individuals. You produce for the Axis or you're brutally liquidated.

To preserve civilization, let's fulfill our duties conscientiously on the production front—and buy more and more War Bonds and War Stamps. We'll be better off without some of the luxuries. Nothing else is important now but Victory for Humanity!

Wesley G. Paulson



Sub Propeller Shafts Needed Quickly!

Story of How Ryerson Ingenuity Saved Five Weeks

URGENTLY needed at a distant shipyard were fourteen forged submarine propeller shafts that must pass Navy specifications.

Forgings were specified, but none could be secured in time.

Quickly available in Ryerson stocks were cold rolled bars — the right size — but in five different analyses.

Navy Inspectors were skeptical. Could Ryerson heat-treat and assure uniform physicals—also furnish pull tests for each bar? Well, no; because the piece left after the bars were cut to the needed length, would be too short to make a standard 6" test sample. A delay of five weeks loomed ahead....

Then Ryerson metallurgists found a way: Inquiry revealed that the shafts were to be machined down at each end for a distance of 7". So, why not cut a piece from the side of each bar, before machining—enough for all tests yet leaving sufficient stock for machining to size? The idea worked perfectly.

The data charts always furnished with Ryerson Certified Steels provided the exact analysis of each bar and assured proper heat-treatment. A few minutes hacksaw work yielded the necessary test samples... and all fourteen bars passed the rigid



Cutting 6" test pieces from side of bar without affecting length.

Navy Inspection with flying colors.

Ryerson ingenuity has helped many manufacturers in solving production problems—has also cut ultimate delivery time from months to days. Ryerson engineers and metallurgists, backed by a century of service to the nation, are ready to work with you in accordance with WPB plan in making the most of all available steel.

JOSEPH T. RYERSON & SON, INC., Chicago - Milwaukee - St. Louis - Cincinnati - Detroit - Buffalo Claveland - Boston - Philadelphia - Jersey City

Grinding Wheel Fundamentals

By R. A. REED

THERE are many new users of grinding wheels today. And for their benefit it is worth while reviewing some of the fundamentals that may seem like "old stuff" to the experienced grinding hand or foreman. The place to start this review is at the beginning—when the wheel reaches the user's plant.

Unpacking

Careless handling and improper storage of grinding wheels may have a serious and costly effect on their life, cutting action, and safe operation. Grinding wheels are essentially cutting tools and should be treated with the same care as expensive reamers or milling cutters.

One of the common causes of wheel

breakage is careless handling. Dropping a wheel or accidentally striking it against a hard object can easily produce a crack which, although unnoticeable under casual glance, may cause the wheel to break when it is mounted and brought up to speed.

Grinding wheels and other abrasive products leave the manufacturer's plant packed in a manner which should safeguard the contents against the roughest sort of treatment in transit. When unpacking the wheels, ordinary care should be exercised. After unpacking them, they should be lightly tapped with a wooden mallet to be sure they are of sound structure and then inspected to see that the size, grain, grade and other specifications corres-



Wheels not in use should be returned to racks or tool crib. Handle wheels care-

Handle wheels carefully and keep them off floor to prevent damage.

damage.
(This is No. 5 in the series of "On the Grinding Line" posters issued by the Norton Co.)









THE ILLUSTRATIONS—Top (Left) Unpacking some of the smaller grinding wheels. (2) Here's how the larger wheels are packed. (3) Tapping a large grinding wheel with the wooden handle of a screw driver. (4) Here is the safe way of transporting large grinding wheels on two-wheel trucks padded with heavy linoleum.

pond with the original order.

If any wheels should happen to be received in a broken condition, this should be reported at once. Likewise, if in tapping a wheel with a wooden mallet no clear ring is emitted, it is well to be on the safe side and reject the wheel. The wheels must be perfectly dry and quite free from sawdust when they are tapped.

Grinding wheels are fragile and may be chipped easily or otherwise damaged in moving from one place to another. This is especially true of thin wheels and those having thin edges or faces. A chipped edge or a hidden crack might render a wheel useless for its intended purposes.

Small wheels can be moved easily in wooden boxes and, of course, trucks may be used for large wheels. Within this range are countless sizes and shapes too numerous to mention. Keep in mind they should be handled with the same care as if they were glassware.

Hand or electric trucks should be padded and the wheels protected from falling and from any hard or sudden blows or shocks.

Large wheels are sometimes rolled on their faces. This should be done only on a padded and clean floor. Two strips of heavy floor linoleum make an ideal padding as they can be moved progressively along in front of the wheel to provide protection all the way. Never roll a grinding wheel directly on a bare floor.

In trucking wheels larger than 18 and up to 36" in diameter, it is rec-

THE ILLUSTRATIONS—Top (right) Group of flaring cups nested on shelves. (2) Section of racks for 7" wheels. (3) Thin cutoff wheels stacked on a flat surface, preferably a metal plate. (4) Heavy, large diameter wheels are best stored on edge as shown. If such wheels have to be left out of racks, they should be stored on parallel skids.

ommended that they be placed on their edges but tilted back about 15° and with boards or corrugated paper between them. Wheels larger than 36", both for convenience of handling and prevention of breakage, should be carried on trucks which will support them in a vertical position.

Storage

It is important that grinding wheels be stacked or stored properly so as to utilize the available storage space most advantageously, to protect the wheels against chipping and breakage and, finally, to make it possible to locate a specific wheel promptly.

Wheel racks should be so constructed that once the wheels are on the shelves, there will be no chance of rolling off. This can be accomplished by making the shelves of parallel wooden rails spaced apart according to the sizes of wheels to be stored on the same shelf.

The larger and heavier wheels are brought toward the bottom of the rack, which, of course, is desirable. Every wheel should be visible from the front of the rack and the wheels so grouped that a prompt check can be made on wheels available.

Straight wheels over 2" diameter, except resinoid, rubber and shellac bonded 4," and thinner, should be stood on edge.

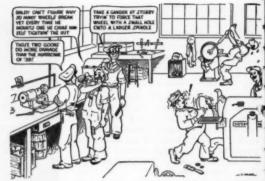
Dish and cup wheels, provided they are not over 6" diameter and do not have a thin or fragile edge, may be stacked either flatwise or on edge.

Resinoid, rubber and shellac bonded wheels of the cut-off type, ¼" and thinner, should be piled horizontally on a plane surface, which should be free



Do not force the wheel onto the spindle.

Tighten nut only enough to hold wheel firmly.



from any imperfections and not likely to warp. A clean, machined steel plate, $\frac{1}{4}$ " or 5/16" thick would be very suitable for this purpose.

Dish, cup, and even straight wheels, not over 6" in diameter and made by either the vitrified or silicate process, may be stored either flatwise in stacks, or on edge, whichever is the more convenient. If, however, there is a thin edge on the wheels, it is advisable to stack them flat, particularly wheels of the softer grades.

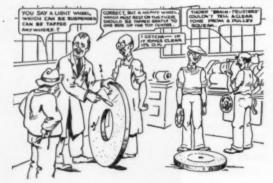
Wheels 2" or less in diameter are best protected by placing them in boxes or drawers with the contents plainly labeled on the outside. Mounted wheels and points should be left in the same boxes in which they are received.

Supervision of Wheel Stock

Since grinding wheels are a form of cutting tool, their stock should be indexed and supervised in much the same manner as other tools such as drills, taps, milling cutters and so forth. This implies that accurate records should be kept of all grinding wheels on hand, together with the requirements established for each kind of wheel.

Mounting the Wheel

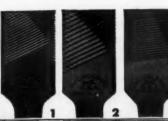
Before mounting a wheel, test it again by tapping with the wooden han-



When mounting a wheel always place a soft washer (blotter) between the wheel and each flange.

Tighten flange screws evenly and firmly—but not excessively.

The right files for jobs like these







help to speed the right tools for jobs like this



We MUST win this war . . . with maximum output on our production fronts to put maximum equipment on our fight-

ing fronts. There must be top speed and efficiency down to the smallest detail of war-factory operation.

Filing. Because The right file for the job is important, Nicholson has set up specific manufacturing facilities for making special files.

Every Nicholson or Black Diamond Special Purpose File has been definitely proved for added effectiveness on the work for which it is intended. Four of the more widely used special types are shown above—(1) For Stainless Steel, (2) for Aluminum, (3) for Brass, (4) for



Lathe filing. FREE TECHNICAL BULLETINS on request.

For your file needs—and further aid in solving filing problems—contact your mill-supply house.

NICHOLSON FILE CO., Providence, R. I., U. S. A.
(Also Canadian Plant, Port Hope, Ont.)

NICHOLSON FILES

FOR EVERY PURPOSE





As the wheel wears smaller, increase its rpm to maintain good cutting action and prolong wheel life.

For chatter-free finish and longer wheel life, keep wheels in balance.

dle of a screw driver to make sure that it has not been damaged in handling or in storage. A clear ring indicates a sound structure. Even if this operation was performed when the wheel was unpacked, it should be repeated before mounting.

Seven important points to keep in mind when mounting a wheel are:

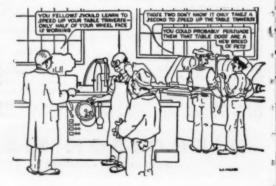
- Make sure the flanges on both sides of wheel are of the same diameter.
- Don't use washers instead of flanges.
- Don't use flanges without proper clearance or relief.
- Don't cause flanges to bend by excessive tightening.

- Clean all dirt and foreign material from sides of wheel and flanges.
- Don't force a wheel onto an arbor where fit is tight.
- Don't use loose washers or bushings to try to make wheel fit machine for which it was not intended.

When starting a machine, especially after mounting a new wheel or remounting one previously used, stand "out of line" for at least a minute before starting to grind. If it is a portable machine, hold it under a bench, or inside a heavy casting, for a minute or so before starting to work.

For rapid stock removal, table traverse should be about % of the wheel width for each revolution of the work.

Set table dogs so that no more than 1/3 of the wheel runs off the work.



78

It's healthier on the Attacking Side

Whether you're fighting a Jap 5 miles up or tackling a problem in the shop . . . it helps a lot to have the jump on your competitor.

ALTER EGO: True as gospel. Competition forces progress. We've changed over to welding of ships, plan a tanks and guns. Why? Because the Axis had a head start in designs and output. They orced us to make 'embetter and build 'es faster.

Imagine that It took a threat to our

very lives to drive home the necessity of converting old methods to new!

ALTER ECO: But have we learned our lesson? Will we be content to plod along after this acrap is over? As for me, I'm going to convert now to the offensive for tomorrow's Battle for Business.

That's the spirit! Let's take off our rose-colored élasses and put on our reading glasses. Let's learn all about welding so we can get the jump on competition.

THE LINCOLN ELECTRIC COMPANY CLEVELAND, OHIO

ALTER EGO: Literally, "one's other self"-- the still,

Photo Coursesy: Lookhood Aireraft Corp.



Grinding Wheel Speeds

As a rule, vitrified and silicate wheels can be safely used at 6500 surface feet per minute and resinoid and rubber wheels at 9500° sfpm. Coarse soft wheels are not strong enough for these speeds and cup wheels and cylinders should also be run at slower speeds.

*Excepting cut-off wheels.

Do not use a speed higher than recommended by the wheel manufacturer. This speed is shown on the wheel and is indicated in rpm.

The difference between feet" and "revolutions" per minute must be kept in mind. For example, if you run a steel tape around the outside of a 24" wheel, you will find that the wheel measures a little over 6 feet around. For every revolution of a 24"

Operating Speed

This table indicates maximum peripheral speeds for various types and grades of wheels. These speeds should not be exceeded except upon the distinct recommendation of the grinding wheel manufacturer for each specific case, and then only if the equipment is in a satisfactory condition.

Types of Wheels	Vitrified and Silicate Bonds			Organic Bonds			
TYPES OF WHEELS	Soft	Med.	Hard	Soft	Med.	Hard	
Type 1—Straight Wheels Type 4—Taper Wheels	F. P. M. 5,500	F. P. M. 6,000†	F. P. M. 6,500	F. P. M. 6,500	F. P. M. 8,000	F. P. M. 9,500	
Types 5 and 7—Recessed Wheels	5,500	6,000†	6,500	6,500	8,000	9,500	
Type 2—Cylinder Wheels	4,500	5,500	6,000	6,000	8,000	9,500	
Dovetail Wheels Types 11 and 12—Dish and Flaring Cup Wheels Type 13—Saucer Wheels	4,500	5,500	6,000	6,000	8,000	9,500	
Type 6—Deep Recessed Cup Wheels	4,500	5,000	5,500	6,000	7,500	9,000	
‡‡Cutting-off Wheels Larger than 16" dia.						7,500 to 14,000‡	
‡‡Cutting-off Wheels 16" and smaller						10,000 to 16,000‡	

Maximum speeds indicated are based on the strength of the wheels and not on their cutting efficiency. Best speeds may sometimes be considerably lower.

[†]On precision machines, vitrified and silicate wheels in medium grades may be operated at 6,500 peripheral feet per minute.

Depending on Stability and Design of Machine.

Cut-off, grooving, slotting, coping, jointing, etc.

WHEREVER PRODUCTION DEPENDS ON PUMP RELIABILITY

- Specify Brown & Sharpe



ROTARY GEARED PUMPS

Spur Gear
Helical Gear
Bronze
Reversible
For Hydraulic Operation
Motor Driven

CENTRIFUGAL PUMPS

Motor Driven
Several styles for a wide flexibility of installation

Also No. 8 Vane Pump for lubrication

Use dependable Brown & Sharpe Pumps

. . . . for cool ant – pressure – lubrication – hydraulic operation of machines – and miscellaneous combinations.

Tell us your pump needs —

Providence, R. I. U. S. A.

BROWN & SHARPE

wheel, any given point on the outside surface of the wheel travels about 6 feet. If the 24" wheel is mounted on a machine which runs at 100 rpm, the surface speed is a little more than 6000 surface feet per minute.

In speaking of general classes of wheels or general types of grinding, wheel speed is usually given in surface feet per minute. Machine speeds, however, are usually indicated in rpm and most speed indicators and tachometers read in rpm. Therefore, it is frequently necessary to translate surface speed into rpm for various sizes of wheels. The accompanying tables make this convenient. Where a wheel is used at the same speed (rpm) until worn out it is not necessary to make any translation. Simply make sure

Table of Speeds

REVOLUTIONS FER MINUTE FOR VARIOUS DIAMETERS OF GRINDING WHEELS TO GIVE PERIPHERAL SPEED IN FRET PER MINUTE AS INDICATED

Diameter of Wheel in Inches	PERIPHERAL SPEED IN FEET PER MINUTE								
	4,000	4,500	5,000	5,500	6,000	6,500			
	Revolution	o per Minu	te						
1	15,279	17,189	19,098	21,008	22,918	24.82			
3	7,639	8,594	9,549	10,504	11,459	12,414			
3	5,093	5,729	6,366	7,003	7,639	8,27			
4	3,820	4,297	4,775	5,252	5,729	6,20			
5	3,056	3,438	3,820	4,202	4,584	4,96			
6	2,546	2,865	3,183	3,501	3,820	4,13			
7	2,183	2,455	2,728	3,001	3,274	3,54			
8	1,910	2,148	2,387	2,626	2,865	3,10			
10	1,528	1,719	1,910	2,101	2,292	2,48			
12	1,273	1,432	1,591	1,751	1,910	2,06			
14	1,091	1,228	1,364	1,500	1,637	1,77			
16	955	1,074	1,194	1,313	1,432	1,55			
18	849	955	1,061	1,167	1,273	1,37			
20	764	859	955	1,050	1,146	1,24			
22	694	781	868	955	1,042	1,12			
24	637	716	796	875	955	1,034			
26	588	661	734	808	881	95			
28	346	614	682	750	818	887			
30	509	573	637	700	764	828			
32	477	537	597	656	716	776			
34	449	505	562	618	674	730			
36	424	477	530	583	637	690			

OFFERS THE logical WAY TO GRIND INTERNAL CAMS



The fundamental construction of Bryant Internal Grinders makes them as readily adaptable to arinding internal cams and irregular shapes as grinding round, straight or tapered bores.

The cylindrical slide bar used in standard Bryant design provides both longitudinal traverse and cross feed as governed by the master cam. The master cam controls the cross movement of the wheel in relation to the rotation of the workthereby generating the desired cam form.

The Bryant way is the logical way to produce accurate internal surfaces at a profit. Further information is yours for the asking.



BRYANT CHUCKING CO. SPRINGFIELD, VERMONT, U. S. A.

that the speed is not higher than shown on the wheel blotter or the wheel tag.

In some places it is customary to maintain a fairly uniform surface speed in order to keep the grinding action the same. This means that the rpm must be increased as the wheel wears down.

Grinding Pressures

Side pressure on thin straight wheels

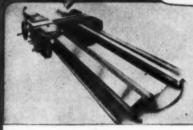
is dangerous. Most wheels will stand quite a lot of straight radial pressure but there is a limit to what they can "take." Heavy pressure with vitrified wheels is apt to cause the wheel to get hot and if it gets too hot and too quickly, breakage is likely to occur. Sudden bumping or pounding is apt to be more dangerous than steady even pressure.

Noise "Centrifugal Force," which is the force that tends to rupture a given wheel when overspeeding, increases as the square of the velocity of that wheel. For example, the centrifugal force in a wheel running al 3,500 surface feet per minute is 40 percent greater than in the same wheel running al 4,500 surface feet per minute, although the speed is actually only 22 percent greater.

. 41	PERIPHER	AL SPEED I	N FRET PER	MINUTE		Diameter of
7,000	7,500	8,000	8,500	9,000	9,500	Wheel in Inches
Revolution	a per Minu	te	2			-
26,737	28,647	30,558	32,467	34,377	36,287	1
13,368	14,328	15,278	16,238	17,188	18,143	2
8,913	9,549	10,186	10,822	11,459	12,115	3
6,685	7,162	7,640	8,116	8,595	9,072	4
5,348	5,730	6,112	6,494	6,876	7,258	5
4,456	4,775	5,092	5,411	5,729	6,048	6
3,820	4,092	4,366	4,538	4,911	5,183	7
3,342	3,580	3,820	4,058	4,297	4,535	8
2,674	2,865	3,056	3,247	3,438	3,629	10
2,228	2,386	2,546	2,705	2,864	3,023	12
1,910	2,046	2,182	2,319	2,455	2,592	14
1,672	1,791	1,910	2,029	2,149	2,268	16
1,485	1,591	1,698	1,803	1,910	2,016	18
1,337	1,432	1,528	1,623	1,719	1,814	20
1,215	1,302	1,388	1,476	1,562	1,649	22
1,115	1,194	1,274	1,353	1,433	1,512	24
1,028	1,101	1,176	1,248	1,322	1,395	26
955	1,023	1,092	1,159	1,228	1,296	28
891	955	1,018	1,082	1,146	1,210	30
836	895	954	1,014	1,074	1,134	32
786	843	898	955	1,011	1,067	34
742	795	848	902	954	1,007	36

Im Tellin You..

Seeing as how I've been helping to build LeBlond Lathes for 40 years now, the boss figured I ought to have a few ideas about how to take care of them. So I'm supposed to spout off a little to you fellows who are running them to help you "Keep 'em Turning". I've got a pet theory that I can prestly well size up a lathe operator with just a quick look at the bed and carriage of the lathe he has been running...



When a LeBland Lathe.... leaves our plant, the bed looks like this - all accurately scraped and polished.



But if the operator plays the "Village Blacksmith", using the bed or carriage for an anvil to drive mandrels in and out, and if he uses it as a rack for hammers, wrenches, and chucks...



...it won't be long before he pounds out the accuracy or wrecks the lathe by feeding the carriage against an obstacle lying between the carriage and headstock.



The smart operator has a board at the tailstock end for his tools. He keeps the bed free of heavy furnings and wipes the shears clean with oil. Easy things to remember, but mighty important.

The R.K.LeBlond Machine Tool Co

CINCINNATI, O HID

Grinding Wheel Hoods

The hoods and other protection devices all contribute to grinding safety. If all of the safety rules were always followed, breakages would never occur and hoods would not be necessary. There is always the chance, however, that someone will some day forget one of these things and breakage might result.

Breakages do not occur often, but because of the high speed at which grinding wheels travel in use, the results are apt to be serious unless proper

guards are in place.

It is always expected that the wheel will not break, and if it has been properly handled and mounted and is not in any way abused it will not, but the guard should always be in place "just in case."

Goggles

A hood can't possibly catch and retain all the small particles of grit and steel which are loosened during any dry grinding job—especially an off-hand job where the work is moved around and held at various angles. It doesn't take a large particle to do a lot of damage to an eye. Safety goggles are the best protection against mishaps of this kind.

Mounting and Balancing

On precision grinding jobs such as cylindrical and centerless work, correct wheel mounting and wheel balance are very important. This procedure in mounting is suggested.



A strong, well-designed guard for foundry grinding.

After being satisfied by inspection and tapping that the wheel is sound, place one of the blotters, usually supplied by the wheel maker, on the sleeve.

Slide the wheel on the sleeve, being careful not to force it. Place another blotter on the wheel sleeve flange and slide this on to the sleeve.

Line up the cross mark on the





Position 2

Diagram showing balancing of grinding wheel.



• • • the photographer said. And while the operator leaned against the machine and looked awkward, this contour milling operation continued at full speed!

When a DUPLIMATIC is attached to any machine tool—such as this vertical mill—all an operator does is load the work and push a button! The rest of the operation is automatic.

WHAT'S A DUPLIMATIC?

The Dual DUPLIMATIC is a separate, self-contained, machine tool control mechanism. It is used with your present tool room tools. It is moved alongside any engine or turret lathe, boring mill, shaper or vertical mill and connected with any two feed screws in one day's time. The following day the operator of that machine—or another operator even less skilled—should increase production by 7 times... @ASYMES...

In the vertical mill illustrated, the Dual DUPLI-MATIC turns the two feed screws automatically

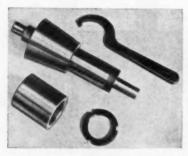
and simultaneously, thereby generating a smooth contour. (It is the only control that can turn two or three screws simultaneously.)

HIGH SPEEDS AT TOOL ROOM ACCURACIES

Because DUPLIMATICS can quickly convert too room machine tools over to high production speed automatic operation without any sacrifice in accuracies, DUPLIMATICS have been accepted as standard in the biggest wa production plants. Contour machining which DUPLIMATICS control include: TORPEDOES—BOMBS—GUN PARTS—AIRPLANE ENGIN PARTS—TANK TURRETS—ANTI-AIRCRAFGUN PARTS—AIRPLANE LANDING WHEEL... on all of these, scrapped parts have been reduced, hand-finishing cut and accuracie easily held.

Send now for information. If possible send a sketch or print of the work.





Dissassembled view of balancing arbor.

flange with a similar mark on the sleeve and insert the screws.

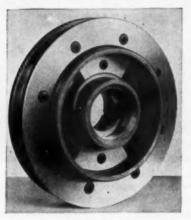
Take up on one screw until it is snug; then go to the diametrically opposite screw and draw it up snug. Then draw up the screw that is 90 degrees from the other two and continue this procedure taking up a little at a time until all screws are tight.

Always balance a new grinding wheel before mounting it in the machine.



A typical balancing stand.

Unless the wheel is balanced, it will set up vibration in the grinding machine which will be evident on the work surface in the form of chatter marks. Most cylindrical grinding machines made today are equipped with wheel sleeves having adjustable balancing weights so that the wheel and its sleeve can be balanced as a unit. Here is the method of procedure in balancing a wheel on one of these sleeves:



Balancing wheel sleeve with balancing flange in place, showing heavy balancing weights.

After mounting the grinding wheel on its sleeve, rough true the wheel so that it is perfectly round.

Remove the sleeve and wheel as a unit and mount it on a set of leveled balancing ways.

Remove the adjustable balancing weights from the wheel sleeve and allow the wheel to rotate until it comes to rest. This will be with the heavy side down.

Replace the balancing weights in the sleeve on the light or top side. By subsequent adjustment and trial, move the weights around equally in the sleeve toward the light side until the wheel is in balance.



Production of war materials has been speeded up, doubled and increased beyond peace time's wildest dreams . . . work hours have been lengthened, single working forces increased to two shifts, and in some cases to three shifts, seven days a week.

Machines are being operated many more hours and at a higher speed than ever before . . . several years of wear and depreciation are being crowded into one . . . machines are fighting the "Battle of Production" . . . and are proving themselves masters of the job . . . a tribute to their makers.

Many of these machines producing war materials are air operated and most air operated machines are equipped with Ross Air Control Valves...the valves that have been engineered and built to stand up under continuous use and adverse conditions.

Today all of us are in this battle up to our hilts; therefore, let's cooperate with each other. Let us share with you our experience gained through more than 16 years of concentrated efforts in the air control field . . . let us help you get maximum production out of your air-actuated machines and equipment . . . as true soldiers, let us cooperate with you in fighting this "Battle of Production."

ROSS Operating VALVE CO.



* A SIZE AND TYPE FOR EVERY OPERATION





Illustration at the left shows the wrong way to hold a wheel dresser. The correct way is shown at the right. Note that the heel of dresser should be held firmly against work rest.

Remove the balancing arbor and remount the wheel in the machine. Finally true it again before grinding.

Wheel Truing

Truing is necessary to insure a perfectly round wheel. Usually the truing tool is a diamond. To restore a sharp cutting face to a wheel that has become loaded or glazed, the wheel is dressed. In place of the diamond, abrasive wheel dressers often can be used. These points should be kept in mind when truing a wheel:

Use a size and shape of diamond suitable for the size and specifications of the grinding wheel. A sharp pointed diamond is preferable for rough truing while a more blunt point can be used for fine finish truing.

Turn the nib in the diamond tool holder frequently to present a sharp point or edge to the wheel.

With the diamond tool firmly clamped in the holder, approach the grinding wheel at its highest point, which is usually in the center of the wheel face.

For rough truing, feed the wheel into the diamond or truing tool about 0.001" and traverse the truing tool across the wheel face at a medium rate. Feed the wheel in

about 0.001" at each pass until a perfectly round wheel is assured.

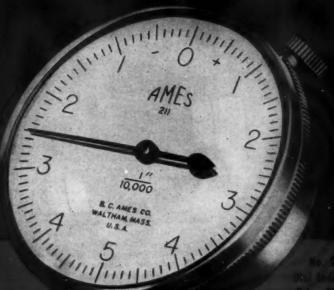
For high finish grinding, it is best to bring the diamond almost in contact with the high spot on the wheel face, turn on the coolant and Feed the wheel start traversing. in 0.001" to 0.002" at each pass until contact is made. Then reduce the table traverse to the slowest speed comparable to the finish desired and at the same time reduce the amount of feed of the wheel toward the truing tool. For the finest finishes, make several passes of the truing tool across the wheel without any infeed whatsoever.

Always remember to turn on the coolant before the diamond is advanced to the wheel. Also be sure the wheel spindle bearings are warmed up, so as to provide normal grinding conditions before starting to true or dress.

Cylindrical Grinding Hints

Before mounting the work in the machine, clean the center points and the center holes in the work. The condition of the centers or the center holes is the most common cause of poor grinding.

If the headstock or footstock centers are removed, always be sure to AMES and ACCURACY ... HAND in HAND FOR 47 YEARS



No. 21) Dial Indicator Price \$27.00



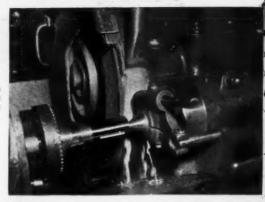
GAUGES AND

DIAL INDICATORS

Write for Catalog No. 54 showing complete line of Dial Indicators, Micrometers, Gauges and Comparators.

B. C. AMES CO., WALTHAM, MASS., U. S. A.

Wheel truing device with diamond tool holder on a Norton cylindrical grinding machine.



wipe out the spindle before re-inserting the center. Also, inspect the center shank to be sure it is free from nicks or specks of dirt.

In the case of hardened work, it is often desirable to grind the center holes to be sure they are accurate and clean.

Lubricate the center holes with red or white lead mixed with oil.

Always clamp the driving dog securely to the work.

Adjust the driving pin in the face plate so that it engages the driving dog squarely. Then tighten the pin securely so it will not slip. Assuming the work has to be traversed, set the table dogs so the wheel over-runs the end of the cut about, one-fourth of the wheel width.

In hydraulic table traverse machines, remember to "bleed" the table cylinder before using the machine in the morning, or after a period in which the machine has not been in use. It is performed to rid the hydraulic system of any air that may be trapped in the lines and which, if present, will cause the table to move in a jerky fashion. There is usually a brass plate on the machine with instructions how to accomplish this bleeding operation.



Tools and cuiters are easily ruined by using a grinding wheel that is too hard for the job.

Now more than ever, proper grinding practice is necessary to prevent waste of valuable cutting tools.





Write Today For These Engineering Data Units

Get the complete story on these Multiple-Tooled Norwood Lathes for mass-production machining. Write for your set of these engineering data units giving full descriptions, specifications, and complete data.

NORWOOD LATHES

Multiple Tooled
... For Foster
Production Machining

Investigate this Multiple-Tooled Lathe . . . Equipped and Tooled for Fast Production on your Specific Production Machining Job

If you've got a mass-production machining job it will pay you to investigate the Multiple-Tooled Norwood Lathe. This heavy, rugged high-speed lathe is made in various basic models with carriage, cross slides and tailstock or turret set-up to most efficiently meet your specific production machining job. It is a fully hydraulic, automatic, basic machine tool for multiple turning, contouring and chucking machine operations, and is capable of performing difficult boring mill operations. SMELL TURNING: Many of these lathes are now being furnished for turning 75 M/M to 155 M/M shells. Ask for folders.

Wire today for folders or for suggestions on tooling up for year specific mass-production machining job

THE NORWOOD ENGINEERING CO. 94 No. Maple Street, Florence, Mass.

Always turn on coolant and start up the work before you begin grinding.

Use a generous flow of coolant at the point of contact.



Check the speeds of the grinding wheel and the work. The wheel should operate between 5500 and 6500 surface feet per minute; the work at about 100 sfpm.

A — Remember that as the wheel wears smaller it tends to act softer and requires more frequent truing.

B — Decreasing the work speed makes the grinding wheel appear harder acting. Thus, if the wheel acts too soft, compensation can be made for this action, to a certain extent, by decreasing the rpm of the work.

C—If the wheel face glazes and loads, increasing the work speed will improve the cutting action.

Use plenty of coolant, of proper type and consistency as recommended by the machine manufacturer.

a—Adjust the coolant nozzle so that the coolant stream falls on the work' at or above the point of grinding con-

b-Clean out the coolant tank at frequent intervals.

c—It may be desirable to use a filter in the coolant system for high finishes, especially on material such as aluminum alloys.

The traverse speed for roughing should be set so that for each revolution of the work, the table will advance a distance slightly less than the width of



To eliminate whipping, use plenty of steadyrests—
particularly with long, slender work.

In adjusting steadyrests, always bring up bottom shoe first, and back shoe second.

TOUGH BENDS SIMPLE

DER Takes them all in S-T-R-I-D-E

SHORTER RADIUS BENDS



- Difficult production bending jobs a PINES specialty. Simple production bending jobs a PINES "natural."
- Exclusive, patented BOOSTER AT-TACHMENT makes shorter radius bends - automatically unloads dies.
- PINES Angle-of-Bend Selector permits instant setting for any bend up to 200 degrees.
 - Sizes for bending pipe up to 4"-
- Hand or automatic clamping.

Phone, Wire or Write for Further Information



FABRICATING EQUIPMENT Turn diamond often to keep it sharp and maintain uniform wear.

Excessive truing wastes wheels and diamonds—light cuts do a better job.



the grinding wheel. For finish grinding, the traverse speed is greatly reduced.

On long, slender work, use steadyrests to prevent the piece from vibrating. The number of steadyrests used for a grinding operation is largely a matter of judgment and experience. In general, place them about a foot apart if the work is of small diameter, and about 2 feet apart if the work is over 3" in diameter. When placing the rests always locate the first one at the center of the work and use a like number on either side.

The use of a steadyrest requires restraint on the part of the operator. Ordinarily, the lower shoe is brought up snugly against the work with the top knob. A horizontal shoe rests lightly but firmly against the work and is operated by the front knob. Too great a pressure on the horizontal shoe will spring the work in toward the wheel. As a result the work will be ground smaller opposite the rest than at the other points. Experience will soon teach the operator the correct pressure to apply for the particular piece being ground.



Have you our Engineering Data Sheets on the new line of

BABY GUSHER Machine Tool Coolant Pumps?

Made in four types; 1/30 and 1/10 h. p. for small machine tools and machines requiring from 4 to 10 G. P. M.

Write for descriptive literature.

The Ruthman Machinery Co. 1819 Reading Rd., Cincinnati, Ohio



GOOD NEWS!

Transfer Points Eliminate Guesswork in Die Making

There's no chance for error when you use transfer screws as markers in setting dies. Points are of uniform height above hex base. Six accurately made and hardened screws nest in a special holder with hex wrench tip. Made in ½ to 1 diameters. 3/164 \$1.50 per set \$/165 \$1.25 per set 7/169 \$1.40 per set 1/4* 1.20 * \$/82 1.25 per set 7/16 \$1.40 per set 1/4* 1.20 * \$1.50 * \$1.

HEIMANN MFG. CO.,

URBANA, OHIO



The machine tool industry has established new records in war production by producing machines in quantities without sacrificing accuracy and quality . . . Kearney & Trecker has developed many such machines, among them the M-Series Simplex — the newest machine in the bed type field.

It answers the demand for a medium-sized machine to efficiently produce the thousands of small parts vitally needed for planes, tanks and guns. Because its basic design is the same as the larger machines, it has strength and ruggedness to spare.

KEARNEY & TRECKER CORPORATION . Milwaukee, Wisconsin, U. S. A.

Milwaukee MACHINE TOOLS

DANLY KWIK-KLAMPS







STANDARD HALF TURN



WRITE YOUR DANLY BRANCH DANLY MACHINE SPECIALTIES. INC.

Milwaukee, Wis.

Detroit, Mich. Philadelphia, Penna.

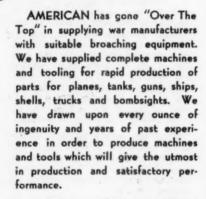
Rechester, N.Y.

meun Metals & Supply Company, Los Angeles; San Francisco

DIE SETS and DIE MAKERS' SUPPLIES



TOP



Shown to the left is an AMERICAN SB-42-5 ton single ram surface broaching machine arranged for broaching split line on aircraft bearings. This machine is provided with a special work table and the part is clamped by hydraulic pressure. High production is obtained.

AMERICAN BROACH & MACHINE COMPANY

BROACHING MACHINES, PRESSES, BROACHING TOOLS, SPECIAL MACHINERY



Producing 30 and 50 Caliber Cartridge Cases with Carbides

Including Recommendations for Improved Die Designs, etc.

By EARL GLEN*

Approved for Release by War Department Public Relations Branch

PRIME reason for the rapidly increasing usage of carbide dies for cartridge case production — from the smallest to the largest sizes—is their greater resistance to wear, reducing down time for die changes (thereby increasing output), reducing the number of die reconditionings required, and reducing the total number of dies required for a given output. In addition to this, of course, the decreased wear of dies of the carbide type insures greater uniformity of product.

While this article relates primarily to the production of brass cases, indications are that carbide dies of the same basic design can be used equally successfully on substitute materials, including steel.

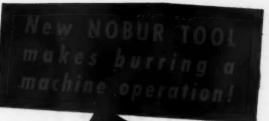
Experience has demonstrated that, to keep production going, the ratio of dies required is only 1 carbide in place of 20 of tool steel. Thus, 200 Carboloy dies will take care of a plant that normally would require 4000 steel dies for the same continunity and quantity of output, particularly when dieselection takes into consideration possibilities of re-working worn dies.

In addition to the decidedly lower initial cost of die equipment for a given production, carbide dies also have demonstrated a marked advantage from the standpoint of operating costs. This is largely due to decreased die maintenance and production delays for die changes, since there are not only fewer dies to handle, but dies do not have to be reconditioned so frequently. Today, it is common to get 1,000,000 pieces per carbide die change, against an average of 50,000 with steel dies. Production up to 4,500,000 pieces before carbide dies required service has been reported. Carbide tapering and shouldering dies, experience has shown, last almost indefinitely.

So far, carbide dies have been used largely in sizes interchangeable with tool steel dies, dimensions having been based on the latter to facilitate substitution. If carbide dies are to continue to expand in use for such work—as they promise to do—it probably would be desirable to give greater consideration to design requirements for carbides in the construction of press equipment.

One of the points to be considered is that die recesses in presses should preferably be larger for carbide dies than for equivalent dies of tool steel. In carbide dies, the wall thickness is reduced by the amount of the carbide

^{*}Engineer Carboloy Co., Inc., Detroit







HORUR USED ON FLEXIBLE SHAFT!

NOBUR burr removing TOOLS are used on any machine tool... lathe, drill press, portable electric drill or at end of a flexible shaft.

Furnished in 1/16" progressive sizes from 3/16" to 1"-NOBUR TOOLS are the economical solution to your burring problems



| | SED on any machine, the smooth, clean, cutting action of the NOBUR will pass the most critical inspection. NOBUR is a time-saving, mistake-saving shop tool that eliminates slow, costly hand methods of burring. It lowers production costs and increases production by hastening approval of finished parts. Easy to operate ... no skilled help is necessary ... green 'trainees' or women operators can do burring with speed and accuracy...NOBUR minimizes costly reworking and enables the operator to do more in less time...NOBUR is simple in construction...rugged...important parts are hardened and ground...shaft is finished to a diameter slightly under its basic size...dauble-edged cutting blade is of special tool steel, cuts freely in either alloy steels or soft metals. Order through your distributor NOW...or write for literature direct to the

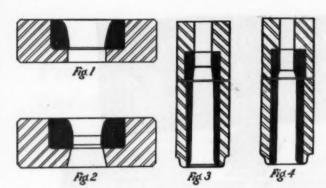
can be handled!

NOBUR MANUFACTURING CO. 910 North Orange Drive

10 North Grange Drive Los Angeles • California NO BUR 100LS

NOBURing

MACHINE TOOL BLUE BOOK



nib, and the case is thus slightly weaker.

The advantages of a larger die recess, die shoe, or holder would include:—(a) ability to provide greater die-case support for the carbide nib, and (b) enable an increase in nib dimensions to give the die greater reserve for re-finishing to larger work when worn.

Changing Over to Carbides

When starting in to use carbide dies, it probably would be best to obtain such dies in finished form from the die-producer for the original set-up. From the standpoint of continuous operation, minimum cost, and avoidance of delays, however, plants should provide as rapidly as possible thereafter their own service facilities for finishing and re-working of carbide dies. When this is done, rough cored dies can be purchased and finished in the cartridge case plant, permitting a further reduction in original die costs and reducing die stock requirements to the very minimum. This practice has been followed for years in wire drawing mills and is now an established procedure thruout that industry.

Since the early days of carbide die usage, grinding, lapping, and general

re-working techniques have been greatly simplified and improved. It is now possible to maintain carbide dies just as easily as tool steel varieties. In this connection, the Carboloy Co., has for some time provided assistance to users in training die service men both at Carboloy and in their own plants. As to service equipment, all that is really required are standard tool room speed lathes, flexible shafts and diamond tools for boring. Some shops prefer the use, in place of the latter, of a selection of diamond splints for pliers for turning ID's of the die nibs.

General Production Sequence

Irrespective of whether carbide or steel dies are used, manufacturers with deep drawing experience would have no major difficulties in setting up to draw cartridge cases.

Basic operations required for production of 30 to 50 caliber cartridge cases consist of:—Blanking and cupping, 4 drawing operations, 3 trimming operations, 2 indenting and heading, 2 tapering and shouldering (combined, usually), one form turning, one mouth chamfering, one drilling or punching for vent at bottom of pocket or indentation, and a marking operation.

SI

KNIGHT



AT FULL PRODUCTION

Our All-Out Victory Program demands 24-hour operation at maximum speed. This means sturdy machines that can stand the production pace, like the No. 40 Knight Miller. It is a universal vertical unit that combines the maximum amount of versatility, rigidity, accuracy and speed without sacrificing any one quality for another. It is designed to perform

many operations at one setting which ordinarily would require several set-ups and often more than one machine—important considerations when time is so valuable.

The No. 40 Knight Miller offers ease and flexibility of operation for efficient light milling jobs—accurate and speedy boring operations due to dial indicators—Timken

mounted spindles—sturdy, rigid table, etc. It is also capable of heavy milling such as taking 1/2" off the 5" faces of steel forgings with a 2" x 6" helical cutter.

W. B. KNIGHT MACHINERY CO.

3924 W. PINE ST.

ST. LOUIS, MISSOURI

WRITE FOR FURTHER DETAILS. After each draw, the case is annealed to remove work hardening effect, while before each draw the case should also be pickled to remove oxides, followed by immersion in rinsing baths, soaping, and a final hot rinse. The same applies to cupping operations.

Blanking and Cupping

Currently practice is divided about 50-50 as to whether or not this operation is performed by the cartridge case producer. By far, the better procedure is to have these operations-particularly the blanking-performed by the material supplier in order to reduce the necessity of handling a large amount of scrap. Normally it is advantageous to purchase the cups rather than dies, since the blanking and cupping can be combined in the same operation. Sometimes, the cupping die forms part of a 2-piece die assembly, the upper half being for blanking. For the blanking portion of the die, tool steel is preferably used. However, experimental work is being done also on carbides for this purpose.

Where discs are purchased by the cartridge case producer, the cupping can be performed in a die of the general shape shown in Fig. 1.

Drawing

The established practice today is to use 4 draws. Where press equipment permits, drawing operations are usually performed in pairs, using 2 dies—an upper and a lower—the latter being self-aligning and usually of semi-floating construction. Carbide dies for these operations do not differ materially from steel dies. This is due primarily to the previously mentioned fact that machines were designed originally for the use of tool steel rather than carbide dies.

For the first draw, it is generally better to use a single rather than a double reduction. Some manufacturers eliminate one die in the second



draw, making this also a single reduction operation particularly in drawing 50 caliber cases. Carbide dies lend themselves somewhat better to this than tool steel dies, since they maintain their shapes longer. To some extent, the die assembly depends on the press equipment available. Usually,





CHARLES F. ELMES ENGINEERING WORKS
244 Month Mongain Street o Chicago, Blands
Also Meninfostural in Conside
WEISANS & WEISON, Od., MONTREAK & TORONTO—Distributors



today, where there is a sufficient length of press stroke, dies are assembled in pairs—2 carbide dies replacing the usual double reduction steel die—one above the other. On presses with limited strokes, a single die may be used effectively.

Dies for this type of work are shown

in Fig. 2. Figs. 3 and 4 show dies for the first and second operations respectively, in shouldering and tapering cartridge cases. Fig. 5 shows a solid die used for form drawing of primer caps.

Recommended Die Designs

The table in Fig. 6 represents the results of a major effort on the part of carbide die producers to simplify the production, maintenance, and procurement problems for cartridge case manufacturers.

Primary step in the simplification of dies, which formerly ran all over the lot, was to group dies for consecutive operations so as to enable re-use of worn dies by a simple re-cutting process which may be carried out in the plant of the cartridge case manufacturer.

Thus it will be noted, only a single basic die size is now required for all draws for 30 caliber armor piercing and tracer and ball jackets. At the outset, of course, it would be necessary to obtain a group of such dies to finish to proper size. To simplify this problem, the rough cored hole of this particular basic die is available in a series of stepped diameters, thus reducing the amount of re-cutting necessary.

After initial setup, it is usually necessary only to purchase dies for the last draws on the jacket, since the dies which they replace can be recut to take care of the earlier draws on the jacket.

Similarly, for the 50 caliber jackets, 2 basic die sizes will take care of top and bottom dies for all draws. For the 30 caliber cartridge case, one basic nib and case size again takes care of all draws, and both top and bottom dies where these are used in tandem. In addition, 30 caliber case dies are now interchangeable with the third and fourth draws of 50 caliber jackets. This

SPEED GRINDING 2 to 5 times!

NEW POROUS GRINDING WHEEL WILL DO IT. FASTER, COOLER, FREE CUTTING. MAKE A TEST!

ORE grinding production? Here's the answer. Por-os-way, a new kind of precision grinding wheel, tested and proved in our laboratories, is now speeding up production in scores of applications. Almost everywhere it's doing 2 to 5 times what was accomplished before per man per machine. Make a test-prove it for yourself!

d

f

9

POROUS, NOT COMPACT. The secret of this new-type wheel is its porous, cellular structure, plus a new vitrified bond. The porous structure means that each tiny grinding point is surrounded and cooled by air between contacts. Result: Por-os-way can take deeper cuts—.010° or more—with ease. Or your regular cuts at faster speeds. Wheel and work stay cool; even unskilled operators rarely burn work. Production is speeded amazingly—from 100% to 400%.

HOLDS ITS CORNER. On hard steels with deep cuts Por-os-way holds its corner, requires a minimum of dressing. To achieve this tenacity with porosity required the use of a tough, new vitrified bond.

FOR ALL APPLICATIONS. Por-os-way grinds hard tool and die steels with ease; softer materials—copper, tin, wood, plastics, too. On softer materials, loading is reduced surprisingly. Por-os-way is not a stock wheel. Grain, grade and porosity must be prescribed to your conditions.

MAKE A TEST. You can quickly determine the possibilities of Por-os-way on your own machines. Write today for the booklet that "tells all" and that offers a prescription blank for proper Por-os-way specifications.



PART	DRAW	CAS	IGURE &	NI	В	ROUGH	FINISHED
PARI	NO.	DIAM.	HEIGHT	DIAM.	HEIGHT	BEAR'G LENGTH	BEARING DIAMS.
30 cal. A. P. Jackets	All 4	1.995	0.500	76	%	3/32	.305 to .496
30 cal. T & B Jackets	All 3	1.995	0.500	76	%	3/32	.305 to .422
30 cal. Jacket	size & resize	1.110	0.432	56 .	5/16	3/16	.306
30 cal. Cartr. Case 50 cal. A. P.	All	1.727	0.625	1	1/2	3/32	.4605 to .655
50 cal. A. P.	1 & 2	2.245	0.625	11/4	1/2	3/32	.649 to .870
& Tracer Jacket	3 & 4	1.727	0.625	1.000	1/2	3/32	.505 to .638
50 cal. Cartr. Case	162	2.740	0.937	11/2	13/16	3/32	.913 & .996
50 cal. Cartr. Case	Others	2.370	0.625	1%	1/2	3/32	.793 to .880

gives greater re-cutting value and cuts down the stocking problem. In this case, there is a slight difference in approach angles between dies for different draws, and the rough cored dies may be obtained with these variations in angles for the initial setup. The variation is sufficiently slight however so that when a fourth – draw die is re-cut to a third-draw die size, the correction can be easily made in the die-refinishing operation.

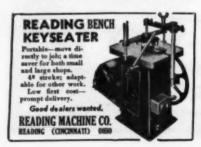
For the 50 caliber cartridge case, 2 basic die sizes are required, the die for the first and second draws having a somewhat larger case diameter and height than the dies used for subsequent draws. One advantage of this procedure is that the larger case provides additional strength for the initial reductions, taken thru a single die

as compared to the use of upper and lower dies for each of the third and fourth draws.

Stripping and Drawing Compounds

One point might well be mentioned. With carbide dies it is preferable to use a mechanical stripper, altho some manufacturers strip with the dies on the reverse stroke-as with steel dies. In the latter case, the back edge of the die must be kept in good condition as otherwise the case will not strip properly and may damage the die or the punch. If the bottom die is used for stripping, a reverse taper of 2 to 3-tenths in the bearing is desirable. Some users of carbide dies provide a stripping edge on the carbide die as well as using a mechanical stripperas an additional precaution.

As to drawing compounds, there are practically as many opinions as there are producers of cartridge cases. Not only are numerous types of compounds used, but the manner in which they are applied and diluted also varies. Some producers, for instance, dilute soluble oil 40 to 1. Others dilute to a thick emulsion. Some flood the dies and work while others control the amount on both the ID of the die and OD of the work by the use of felt wipers, etc., etc.





SUPER-STANDARD REAMERS SOLID TYPE: STRAIGHT SHANKS, TAPERED SHANKS

These Super Reamers, made of tough alloy steel and provided with tungsten tipped cutting edges, hold to size over extremely long runs, turn out accurate work

and reduce scrap. They can be used for reaming steel, iron, aluminum, non-ferrous metals, plastics and other materials.

Many sizes are available for immediate delivery. Inquire about them before stocks are depleted. Ask for Bulletin R-1 on carbide tipped reamers.

SUPER TOOL



CARBIDE TIPPED TOOLS

FOR TURNING - FACING - REAMING - SPOTFACING - BROACHING FORMING - GRINDER RESTS - WEAR PARTS - BORING - MILLING - DRILLING GROOVING - COUNTERBORING - SHAVING - CENTERS - SPECIAL PURPOSES

ED NG S. 496

422

ed. to ne

on es. of

on

ip or

ed

to le.

a

as

42



West Hartford, Conn.

THE burring of aluminum is a science in itself—complex, varied, difficult. Seek counsel from the qualified engineers of a responsible, reliable bur manufacturer before starting new operations.

In general:

For engine head fins: use sharp, long, tapered Mill Cut burs, with special "combination" heat-treatment; 9 or 10 straight flutes best for standard fin bur.

Cleaning and filing: use sharp standard Ground-from-the-Solid burs, rt. or lt. spiral.

Removing burrs thrown up in drilling: use sharp ball-shaped File Cut burs, with herringbone-cut to help hold position.

Speeds and pressures: use 5000 RPM and up, depending on bur size (small bur, high speed). Aluminum is soft, free cutting; use little pressure for "touch" burring. For accurate control, short shanks are best; long shanks permissible where needed for reach.

ALUMINUM IS TRICKY—Choose the burs of a manufacturer who can be depended on for proper bur design and quality control. Beware cut-rate imitations; "all burs look alike"... but they perform far differently. Keep burs sharp... return them to the manufacturer often for resharpening.

Pratt & Whitney pioneered aircraft burs... works closely with the large aluminum makers and fabricators ... makes burs of every kind for every job. P&W engineers will help you solve any burring problem ... no charge or obligation. Kellerflex

Sales Department.



ed.

he

ore

WE'LL GIVE YOU GOOD DELIVERIES ON THESE S.S.WHITE TOOLS...

... if you can furnish high priorities with your orders

* STEEL BURS AND DRILLS

Wide variety of plain, cross-cut and finishing Burs of highest quality — accurately made, expertly hardened and sharpened. Also, flat spear point, square and Twist Drills.

+ FLEXIBLE SHAFT TOOLS

Small portable flexible - shaft-driven outfits for die - sinking, grinding, drilling, boring, reaming, polishing and a hundred other jobs. Operate on 115 V, AC or DC.

* INDUSTRIAL HANDPIECES

Finest quality Handpieces for flexible shaft driven tools in types for light and heavy work. Also right-angle Handpieces.

* ABRASIVE TOOLS

A brasive Points, Disks and Wheels in a large selection of shapes and sizes. Made in abrasives for hard and soft materials. Also, Mandrels, for mounting disks and wheels.

* FLEXARMS

Complete flexible shaft Arms for use on any spare motor. Arms include ball-bearing motor coupling, flexible shaft and casing and industrial handpiece. Types for light and haavy duty.

* OTHER TOOLS

Small Motor Bench Lathes . . . Brush Wheels . . . Rotary Files,

GET FULL DETAILS IN NEW CATALOG TD

Illustrations and specifications of all equipment listed are given in this catalog. Copy, with Price List, mailed to you on request.

S. S. WHITE

The S. S. White Dental Mfg. Co. INDUSTRIAL DIVISION

Dept. H, 10 East 40th St., New York, N. Y.

FLEXIBLE SHAFTS for POWER DRIVES, REMOTE CONTROL and COUPLING

BAR

ADJUSTABLE LIMIT SNAP GAGES



SNAP GAGES

Many plants engaged in war work are using Atlantic Adjustable Limit Snap Gages to quickly and accurately inspect parts urgently required. These gages are manufactured to American Gage Design Standards. Frames are made of Meehanite, a material that will retain its form indefinitely. Thousands of Atlantic Snap Gages are used daily in America's leading plants. When Snap Gages are used little dependence is placed upon the individual's measuring skill. After the gage is set practically any operator can tell by the go and no-go parts of the snap gage whether the work under inspection has been produced to the correct limits. WRITE TODAY FOR FOLDER SHOWING ALL TYPES PRODUCED.

SCHERR TOOL STAND

Write for leaflet.

GEORGE SCHERR CO.,

NEW YORK, N. Y.



Illustrated above is Reed 2-2° micrometer, now available in 1/1000° and with vernier to 1/10000°. Write for folder. Reed Micrometers are also manufactured in 1°, 3° and 4° sizes.

8

The Foremanship Forum

Personality Traits of a Good Foreman

By EDMUND MOTTERSHEAD

"The Foremanship Forum" is con ducted each month by Edmund Mottershead, Dean of the American Institute of Human Relations, to help foremen solve some of their most pressing problems of production, personnel, quality control, and labor relations. The discussion in these columns is based on letters and questions from foremen and plant executives all over the country.

Your letters of comment or inquiry are invited. It is not always possible to use all letters received in the column, but each will receive individual attention and reply. (The Editor.)



WHAT makes a good foreman? or a bad one? What is it, this business of being a foreman? In the last few months, hundreds of men have been more or less consciously asking themselves these questions. A year ago, one airplane plant on the West Coast had about 2,000 employees. In another 8 or 10 months in that same plant, al-

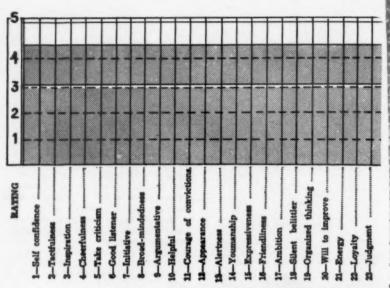
most every one of those 2,000 will be a supervisor, plus 4,000 more new employees who will also be supervisors for a total working force of around 50,000. That is just a sample of what is happening in industry today.

The new Dodge Chicago plant is right now starting at the ground-breaking, foundation-laying stage. In 4 or 5 months a "pilot line" will be in operation. In another year possibly 55,000 employees will be turning out tools of war.

All over the country there has been a greatly increased demand, not only for skilled help but for foremen, supervisors and assistant foremen. In an effort to meet the need, men have been brought up from the ranks as rapidly as possible. As one plant "Super" put it, "We're having one heck of a time! We have new foremen we don't know much about; we've got a few half-baked ones that are a carrying-over from former times; we have a bunch of older men who have had their duties very largely expanded without expansion of their abilities."

That particular "Super," of course, was stating things at their worst. He had just spent 36 hours in the shop ironing out the bugs in the heat treating department.

But by and large, there is plenty of truth in his comments. The foreman today must be a lot more than just a boss. In many plants, indeed, the union situation being what it is, he can



Use this handy chart to graph your personality traits

hardly be a boss at all. What he really must be is a skilled leader of men.

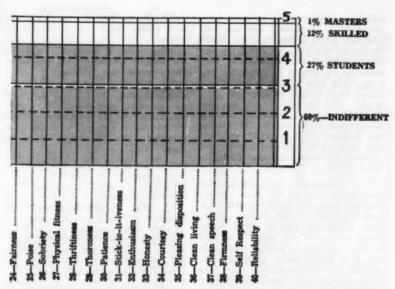
In conducting various training programs for foremen and supervisors, certain problems stand out as more or less common to many who are facing new responsibilities. One foreman in Pittsburgh, for example writes:

"Is there any reliable method of personality analysis or personal self analysis, and if so is it of any real value?"

Yes! But there is something which should come first:—analysis of your job as foreman; and nobody is better qualified to do that than yourself. Certain fundamental qualities are essential to successful foremanship. Analysis of your job, of the relationships with workers and other people that make up your daily activities will determine for you just what these required qualities are.

It is not very often that most of us really give ourselves a thoro going over in a voluntary searching for strong points and weak points. As Lincoln once said:—"If we know where we are and from whence we have come, we may be able to determine where we are going." You who are faced with new and expanded responsibilities should stop and take careful stock of yourself.

Why? Because if you can find your weak points, you can set about doing something to correct them. If you can determine what your strong points are, you can do something to develop them even further. If you can find the real limits of your ability, both developed and potential, you can render yourself and your company better service by concentrating on that work for which you are best fitted. Everybody says that one of your greatest.



after reading the succeeding pages and rating yourself.

jobs as a foreman is to put the right man on the right job, and that means that you have to determine more or less what the man is fitted for. Try it on yourself. And if, by any chance, you should feel in complacency that you have no weak points, that you know all the answers . . . you're just the man who needs the help of a real self analysis. In times like these, when the pressure is on everybody and the pay-off is on results, you can't think realistically in terms of promotion or success until you are willing to think first in terms of improving yourself and your ability to produce and serve.

One other thing should be considered:—the value of self-analysis as compared with an analysis of your personality made by some outside person or agency. There are many reliable personality tests developed for the determination of mental abilities, occu-

pational skills, etc. Most personnel departments are more or less familiar with them. Many are used with a high degree of success. However, such analyses will be of less value to you than a self-analysis for one major reason: Most tests are aimed at discovering abilities and aptitudes previous to training or employment. Your problem, however, is different. You may or may not have had adequate training and experience; you may or may not have adequate abilities. But you DO have the job; and for your own sake and for the sake of your management and the needs of the war effort, it is your problem to make the best of it, to fit yourself into it and make yourself more capable of handling it.

Consequently, you can analyze yourself and get better results. You know yourself better than anyone else. If you have a real desire to get answers

g

r

about yourself you will be more honest about it to yourself and can thus see your own weaknesses and abilities better than anyone else. The secret of effective self analysis is your sincerity of purpose in doing it. Are you really interested in improving yourself in order to improve your work? Self analysis is one big step in doing your own thinking. And by doing your own thinking in solving the problem which is YOU, you will end up by doing your own constructive thinking on everything that comes to your attention.

I am reprinting here a self analysis questionnaire which has been used in training programs by our organization with some considerable success. However, there are two or three things which should be said about it as well as about all similar questionnaires. In the first place, when asked to rate vourself on a scale of, say, from 1 to 5 on various traits such as honesty, fairness, etc. . . . a very logical question is simply: - What is "average honesty," "extra good honesty," perfect honesty," . . . In other words, "where and how set a standard that the numbers mean anything?" The answer is - you needn't. self analysis, you will arbitrarily set something which represents a general standard for yourself. All of your characteristics will then vary from 1 to 5 more or less in harmony. Remember that the purpose of the rating is to discover strong points and weak points as a start in self improvement . . . not to give you a "passing grade" or anything of that sort. I have found people who consistently rated themselves one point high or one point low on everything.

Another thing about self analysis aids, such as this, is that they are at best merely suggestive . . . merely aids. They do not contain any panaceas or cure-alls for your psychological ail-

ments if any. Maybe when you get thru filling these out you'll say to yourself:—"But that's not me at all." May be so. But at least you'll be thinking honestly about yourself and where improvements are necessary.

This Self Analysis Rating Chart consists of 2 parts. In the first part, read the question, then select the answer you think best fits your case, and put the number of that answer in the space provided at the right hand side of the sheet. Thus:

Q. How often do you run down your associates when trying to convince someone of the superiority of your ideas?

1. Never. 2. Seldom. 3. Half the time. 4. Frequently. 5. Always.

All right so sheed. Answer.

time. 4. Frequently. 5. Always. (2)
All right, go ahead. Answer the questions as rapidly as you can.

- How often, when meeting new acquaintances, important people, new business contacts, do you remain your normal self, speak pleasantly and confidently, and get to like them readily?

 Never. 2. Seldom. 3. Frequently.

 Usually. 5. Always.
- 2. How often do you tactfully refrain from making critical remarks about people in whom you have discovered some weakness? 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always.
- 3. How much of the time do you sincerely try to see the good in the other fellow and offer some sincere praise to encourage him to further efforts?

 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always. (...
- 4. Usually. 5. Always.
 4. People don't always stop to realize that your grouchy manner may be due to a sick wife or a sour stomach. They just react to the grouch. How much of the time are you cheerful in spite of things?
 1. Never. 2. Seldom. 3. Frequently.
 4. Usually. 5. Always.
- 5. How often do you respond to unjust criticism by using it as a guide to self betterment?

 1. Never. 2. Seldom. 3. Frequently.

 4. Usually. 5. Always.
- 7. How often do you take the initiative in working out the answers to your problems by thinking for yourself and then acting?



The Halco Hi-Speed Universal Milling Attachment has proven its importance in building tools, dies, jigs, fixtures, wood and metal patterns and other machine products. Its 4-inch vertical travel permits many milling, boring and facing operations in one setup, a factor of con-

Speed - Accuracy -

Five Speeds 350 to 2900 R.P.M. Also 10 speeds 125 to 2900 R.P.M. available at extra cost.

venience to which is added the advantage that the unit can be easily mounted by one man, it weighing only 90 pounds. Each head is unconditionally guaranteed for six months.

IMMEDIATE DELIVERY

(Designers and Builders of Fine Machine Tools)

SEND TODAY FOR FOLDER

MANUFACTURERS OF HALCO PRODUCTS

DETROIT, MICH. 14230 BIRWOOD AVE.,

1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always. () 8. When an idea or a proposition of
yours meets with opposition, how of-
8. When an idea or a proposition of yours meet with opposition, how often do you meet that opposition with reasonable and friendly persuasion instead of the kind of head-on argument that is only won by the fellow with the loudest bellow? 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always.
instead of the kind of head-on ar-
gument that is only won by the fel-
low with the loudest bellow?
4. Usually, 5. Always.
9. "A man convinced against his will, is of the same opinion still", runs the old rhyme. Be honest on this one: Do you still like to feel that you have 'won' an argument? 4. Usually. 5. Always. 1. Never. 2. Seldom. 3. Frequently. 10. Can you criticize people withcut anteoprising them?
will, is of the same opinion still",
this one: Do you still like to feel
that you have "won" an argument?
4. Usually. 5. Always. ()
10. Can you criticize people with-
cut antagonizing them? 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always.
1. Never. 2. Seldom. 3. Frequently.
4. Usually. 5. Always. ()
11. When you find something wrong, and feel that something should be done about it, how often
should be done about it, how often
do you get accordingly against any or all kinds of opposition?
or all kinds of opposition? 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always. ()
4. Usually. 5. Always.
12. Considering the nature of your
work, is your personal appearance such as will command respect and
attention from those about you?
I. Never. 2. Seldom. 3. Frequently.
13. Can you think of the right thing
such as will command respect and attention from those about you? 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always. 13. Can you think of the right thing to say at the right time? 1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always.
I. Never. 2. Seidom. J. Frequently.
14. How often do you sincerely study
14. How often do you sincerely study the man in front of you and really make an effort to think in terms of HIS problems and HIS interests and
make an effort to think in terms of
1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always. ()
4. Usually. 5. Always. ()
opinions on a subject being discussed
15. Are you willing to express your opinions on a subject being discussed by a group you are with? 1. Never. 2. Seldom. 3. Frequently. 4. Unually. 5. Always. 16. Do you go out of your way to make friends with a worker who is shy or retiring or indifferent or belligrently.
1. Never. 2. Seldom. 3. Frequently.
16. Do you go out of your way to
make friends with a worker who is
shy or retiring or indifferent or bel-
ligerant? 1. Never. 2. Seidom. 3. Frequently.
17.How often do you wish that you could increase your income, better your economic and social level in
your economic and social level in
ite?
1. Never. 2. Seldom. 3. Frequently. 4. Usually. 5. Always.
1. Usually. 5. Always. ()
problem, do you sit silent and think
18. When a group is discussing some problem, do you sit silent and think how much better your ideas are than those expressed?
those expressed?
1. Always. 2. Usually. 3. Frequently. 4. Seldom. 5. Never. () 19. Do you ever think of an idea, and then lorget it or get it all mixed
19. Do you ever think of an idea,
and then lorget it or get it all mixed
expressing it in words?
1. Always. 2. Usually. 3. Fre-

quently. 4. Seldom. 5. Never. (____)

20. If you were given a real opportunity to increase your skill in dealing with people, would you respond with enthusiasm and real effort even the it took time from something you wanted to do such as bowling, golf, Saturday night parties, etc.?

1. Probably not. 2. Maybe. 3. If it looked good. 4. Probably. 5. Certainly

Add up your score and place total in blank provided:

Here are 20 traits of character. Sim-

Section B.

TOTAL PART A.

ply rate yourself on a scale from 1 to 5 as indicated: A very high degree of the trait Just above average in the trait 4 3 Average (whatever that is) 2 Just below average Very little of the trait 1 21. Energy 22. Loyalty 25. Poise 26. Sobriety
27. Physical fitness
28. Thriftiness
29. Thoroness
30. Patience 31. Stick-to-it-iveness
32. Enthusiasm 33. Honesty 39. Self Respect 40. Reliability

TOTAL PART B.....(_ All right, now that we have the score, what does it mean? If your total in either part is less than 60, you need help. If it is between 60 and 70, you are about average, and probably will go along holding your job. If you are content to let it go at that, undoubtedly you have not read this far anyway; so we are not going to worry about it either. But if you register 80 or over, in either section, with a really honest analysis, you look like the man for whom every plant superintendent is searching. But let's get a picture of how you really stack up.

Add the score and put your total here:



PRECISION Air Chucking Devices

Anker-Holth"Airgrip" Chucking devices are precision made by master craftsmen. Built into every air cylinder and

chuck are—long life and efficient operation, which assure lower cost and faster production.



Double ball bearings in Model D Anker-Holth revolving air cylinders reduce friction to the minimum and permit speeds heretofore impossible. Heavier cuts, courser feeds and faster production are attained with Anker-Holth "Airgrip" Chucks. Work may be chucked or released without stopping the machine.



Anker-Holth makes a complete line of expanding arbors and collet chucks for projectiles from 20 mm. up to 155 mm. At left —155 mm. collet chuck.

Other Anter-Heith products: Revolving cylinders for feeding bur stock through spindles three-low universal chucks; special "Airgrip" arbors; perellel grip collet chucks; operating valves; and, air filters, automatic lubricators, and regulating valves. Also, hydraulic cylinders.

Wire, or phone, for shipping dates!

Anker-Holth Mfg. Co.

"AIRGRIP" CHUCK DIVISION
332 So. MICHIGAN AVE. CHICAGO. ILL.



A steady flow of extra fine Thread-well Taps is helping set new records for threading tool performance in key war plants. Threadwell Taps are building a reputation that will last long after final Victory. This reputation is for accuracy and performance—it is built on the solid base of better men, better materials and better machines. It is enhanced by long experience and continuous research. It is crowned by the desire to serve—in war and in peace.

WRITE FOR CATALOG ON YOUR FIRM LETTERHEAD

THREADWELL TAP AND DIE CO.
GREENFIELD, MASS.

SALES AGENTS
Canada BRIDGE MACHINERY COMPANY, Monderal
Empland SKYLUX LTD Populary

Insurance statistics discovered long ago, that out of the thousands of men insured, about 60% were more or less indifferent to life, progress, self betterment, etc. About 27% were students, trying to better themselves. About 12% were skilled in their profession or trade and in dealing with people, and 1% at the top were the masters of their trade and leaders of men. Chances are that you, as a typical foreman, are somewhere in that upper 40%. The accompanying chart will help you remember it.

1% MASTERS 12% SKILLED	12%
27% STUDENTS	27%
0%_INDIFFERENT	60%

Keeping that break-down in mind, take a look at the other chart to graph your personality as you have analyzed it. Then you can get a real picture of it. Notice that the personality traits in PART A and in PART B of the rating chart are listed at the left, numbered as they were previously. Across the top and bottom of the graph, from left to right are the numbers from 1 to 5 to correspond with your self analvsis answers. Pay no attention to the shading on the graph for the present, but take a red pencil and locate a dot on the cross lines to correspond with your answers. When that is completed, connect the dots to form an irregular line all he way down the chart.

Now that you have your graph lined up, you can see at a glance more or less where you stand, among the indifferent in part, among the students in part, and among the skilled or masters in part. Where you rate your-



Cost Economies in FLAME HARDENING

17.4% IN

PRODUCTION TIME SAVED ON THIS GEAR

FORMER heat treating methods necessitated that this gear be roughed all over, including the teeth, and then re-machined after heat treatment. Due to greater hardness after heat treatment, final tooth cutting had to be accomplished at slow speeds and feeds.

Fellows Flame Hardening eliminates distortion so completely that lapping is the only after-hardening operation. Total production time from blank to finished gear was cut from 120½ minutes to 99½ minutes, or a saving of 17.4%.

For details on the automatic features and flexible application of this new machine write for "Flame Hardener Bulletin".

- * LOCALIZED
 HEATING
 MINIMIZES
 DISTORTION
- * RE-MACKINING ELIMINATED
- * UNIFORM
 HARDENING
 CUTS
 REJECT LOSS
- * OVERALL PRODUCTION TIME SHOWS SUBSTANTIAL SAVING



THE FELLOWS GEAR SHAPE

Now more than ever you need this help for training Tool and Die Makers

Widely used by many companies and trade schools throughout the

U. S. it meets urgent need for a complete, up-to-date text for training new men, "refreshing" older men, or trouble shooting in the tool room. The shortage of tool and die makers must be met fast by men who know the "whys" and "hows". This book gives them both and more. It shows how to select tool steel; how to ... Consider it one of the vary make tools; how to avoid trouble; how to improve tool performance. Read on the right what others say about this modern text.

TOOL STEEL SIMPLIFIED

By Frank R. Palmer A Vice-President of The Carpenter Steel Company 315 pages - 205 illustrations \$1 postpaid in U.S.A. Elsewhere \$3.50

Low price of \$1.00 per copy makes it economical for training use. Elementary enough to meet the urgent need for a good text for apprentice training. Practical enough to be helpful in advancing the skilled tool maker. Conrains hundreds of practical suggestions that can be quickly applied to daily work to get improved tool performance. Send coupon at right for a copy of Tool Steel Simplified. ... Consider it one of the very

finest books that our local schools of vocational and adult education might use in training of apprentices in machine

trades. R. L. Welch Supervisor Industrial Education State of Wisconsin



THE CARPENTER STEEL COMPANY Dept. C-12, Reading, Penna.

YES, I WANT TO SPEED UP TRAINING WORK. Please send me postpaid your convenient handbook "Tool Steel Simplified". I enclose \$1.00 (\$3.50 outside the U. S. A.) in full payment.

Name.

Company_ (Firm name must be given) Address.

self 4 or 5, you probably don't need much help. Just keep up the good work in those quarters. It's the rest of the line that needs support. The question is, what can be done about it?

First, and most important, . . . start with a STRONG DESIRE. And start NOW. Don't just worry about it and wish it would improve. Get going and

do something about it.

Second, stop for a minute and think about those traits on which you have a good score . . , why do you have that high rating . . . what gives you each of those traits in such a high degree . . . how do you habitually act to make that possible? See if you can't link one or more of your strong points to one or more of your weaker traits and pull up the weaker ones by the same force that gave you plenty of the other. Say, for example, that you rate yourself low on tact, but that you are alert, usually think of the right thing to say at the right time. Maybe

the right thing to say according to your present notions is not always the tactful thing. It may make a point, and it may step on somebody's corns. Use that mental alertness to say the tactful thing instead.

My mother was a master of that. She was a professional musician with exceptionally high standards of excellence. Very often she would be invited to attend performances. I remember one night I went with her to a choir recital. It was frankly not a very good performance. But the organist came up to her afterwards and asked all agog how she liked it, and she replied, "My, you have a very unsual bass section," Which made the organist very happy and still allowed mother to continue thinking that the bass section was unusual . . . ly bad.

So hook yourself together. Build from your strong points.

A plant superintendent in Minnesota recently shot this one at me:





United States Treasury's first Bull's Eve Flag - next to the Stars and Stripes the proudest flag that EX-CELL-D ever flew!

Our Nation at war is much like a modern factory, where men, machines, and money are all required to do a successful job.

Proud of their accomplishment as builders of precision machine tools and aircraft parts, Ex-Cell-O men and manassement are even more proud to do their part in the breader aspects of war work—to join their fellow Americons in the regular buying of United States War Bonds.

Ex-Call-O receives with pleasure the United States Treasury Department's first "Bell's-Eye" Rog—awarded for having rolled more than ninety per cent of all employees in the Pay-Sail War Sovings Plan, and for subscribing reguofy more than two per cent of the company's total pay roll.







EX-CELL-O MANUFACTURES PRECISION THREAD GRINDING, BORING AND LAPPING MACHINES, TOOL GRINDERS, HYDRAULIC POWER UNITS, GRINDING SPINDLES, BROACHES, CUTTING TOOLS. DIESEL FUEL INJECTION EQUIPMENT, R. R. PINS AND BUSHINGS. DRILL JIG BUSHINGS, PARTS ... EX-CELL-O CORPORATION, DETROIT, MICHIGAN !

GRINDERS



Dependable • Efficient Economical

Consider these facts when buying a grinder—Queen City Grinders are equipped with fully enclosed motors to protect from dust and grit. On the heavier machines, motors of 1750 R.P.M. are used which do not require large diameter wheels in order to secure the proper cutting speed at the periphery of the wheel. All grinders are equipped with carborundum wheels at no extra price. And for economy—you can't beat it. Try one of these grinders for 30 days. If you are not satisfied, return it. We can make reasonable delivery.

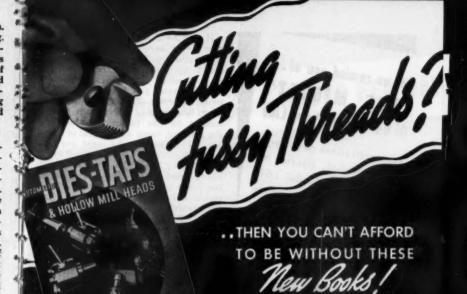
QUEEN CITY MACHINE TOOL COMPANY

217 EAST SECOND ST. CINCINNATI, OHIO

"We have a lot of new foremen. They need several kinds of training. And we think that undoubtedly, training in handling men, in leadership, is important and would do them a lot of good. But what seems to be needed right now is training in reading blueprints, specifications, and in getting that across to the men. What would you suggest we do?"

That's a bad one. Technical knowledge of his job is certainly an essential to a foreman. But there is something of a limit to the skill and technical knowledge a foreman must have. There is a great deal to be said on the score that one of the hallmarks of a good foreman is that he has in his department at least one man who can do every job better than the foreman. One of the largest manufacturers of farm implements in this country took the paint shop foreman and made him foreman of the assembly line and in about 3 years moved him up to general foreman in the plant . . . a series of upward steps he made simply because of his unusual ability to lead the men . . . certainly not because his paint shop experience enabled him to solve the technical problems of other departments.

I know one plant of about 500 employees that was planning to switch to 3 shifts and about 1800 employees in 2 weeks. They had to find about 25 foremen, 25 assistant foremen and about 15 other supervisors in a hurry. At the time they had about 3 foremen and 8 or 10 assistant foremen and a plant superintendent. Two of the foremen were made acting shift superintendents. and some 50 experienced workers were made what they called "working lead men." After a period of about 6 weeks they selected the supervisors needed from this group and then put them thru intensive training along certain necessary lines.



41 — CHASER GRINDING MANUAL for foremen and operators of Namco circular and radial chaser dies and taps — 32 pages with 50 illustrations of practical service hints that insure uniform threads, save time and speed production.

THE NATIONAL ACME

0-42- DIE AND TAP CATALOG explains "RS", the new universal design of collapsing top with ground thread radial chasers — a combination that holds accuracy on difficult jobs.

-shows how circular chasers multiply ordinary chaser life twenty to forty times in hundreds of war production shops — and how you can use circular hollow mills in these same tools, with tremendous savings in tool investment and circular cutter life —"double duty" tools.



s the spirit of "all out" production - these new books are free to those who GIVE FIRM NAME.

NATIONAL ACME

170 EAST 13137 STREET . CLEVELAND ONIO
ACME-GRIDLEY 4-8 AND 8 SPINDLE BAR AND CHUCKING AUTOMATICS - SINGLE SPINDLE AUTOMATICS - AUTOMATIC THREADING DIES
AND TAPS - SOREM MACHINE PRODUCTS - THE CHRONOLOG - LIMIT SMITCHES & POSITIVE CENTRIFIEE - CONTRACT MANUFACTURING

Let us remind you of ... "THE MIDGET" Of Our Coolant Pump Line

For applications requiring a small coolant stream we have designed Model 16-S, to meet "small-space" needs. It incorporates the assured-flow construction features of all Eastern Coolant Pumps.



Write for complete information
EASTERN ENGINEERING COMPANY
42 Pag St., New Haven, Conn.

It may be that in your situation the men could have a short term intensive training in blueprint handling, followed by training in the techniques of leadership they will require. I would suggest you keep one thing in mind, however:-The labor situation in your locality may prove such that a misstep by the foreman in handling the men can cause a good deal of trouble. No longer can he meet any situation that comes up with a loud voice and a heavy hand. The loud voice and heavy hand are on the other side of the fence now. The demands of war production make it imperative that labor relations be maintained in harmony. Your foremen must be able to inspire their men with confidence . . . confidence in their security and in the value of their work, and confidence in their foreman as a leader of integrity, of fairness, of genuine helpfulness. You can buy brains and technical knowledge and skill and hours of work: but you cannot buy loyalty and honesty and perseverance and cooperation. These things the workers must give of their own free will . . . and it is the foreman's part to make that giving the workers' desire. The foreman in modern industry is much like the stomach in the average human body. . . . He has to be tough enough to take all sorts of abuse and say nothing, and still remain sensitive enough to everything that happens so that he can respond to the best interests of the whole system. Technical skill is necessary. So is skill in handling men. My only suggestion would be to put first things first as you see them in your own sit-Handle what problems you can, yourself; and be ready to call in all the help you can find in order to save your own time for that most valuable item of the moment . . . production.

A newly appointed foreman in Wisconsin writes in:—"Tve just been made AR PRODUCTION- 33½ HOURS PER DAY

SUNOCO EMULSIFYING CUTTING OIL increased output 40%...stepped up tool life...improved finish

It takes bullets to win bottles, and American ingenuity is finding ways to set amorning records in the ruce for crms production.

For example, in a plant turning out bulletfor example, in a pigai turning out buses assembling machines, excess beat on tools and work, poor finish, and operators akin complaints were restricting production. A Sun Oil Engineer -- one of those capable Doctors of Industry — was called in to improve conditions. He recommended a change in cutting fluid . . . to Sunoco Emulsifying Cutting Oil. Now they're using Sunoco . . and rate of production has increased 40% — equivalent

has also improved, and skin trouble vanished.

Sun Doctors of Industry and Sunoco Emulsitying Cutting Oil stand ready . . . willing . and able to help you step up production in your shop. For helpful case histories of what they have accomplished for other leaders in the metal working industry.

write for your free copy of

"Helping Industry Help



America. SUN OIL COMPANY . Philadolphia

Sun Oil Company, Ltd., Toronto



HELPING INDUSTRY HELP AMERICA



Sets Record
Cutting
Stainless Steel
Pipe

Since this manufacturer shifted to Technite power hack saw blades, he reports fewer broken blades and longer cutting life. The cost of cutting stainless steel pipe has been lowered. You can achieve similar savings . . . by ordering Capewell's Technite blades from your mill supply man.

THE CAPEWELL MFG. CO. Hartford, Conn., U. S. A.

CAPEWELL



foreman of the night shift in this plant, and I find that there are a great many more things to think about all the time than I had to worry about before. What's the quickest way for me to find out more about everything?"

Friend, it's too bad they haven't yet perfected those educational pills every kid has been dreaming about. There are 2 ways you can find things out fast tho . . . reading and listening. And if you don't especially like to read, listen that much more . . . and watch what goes on around you.

From your own experience you have acquired a certain amount of knowledge of various job techniques. In your new position, you will have under you a number of men who have no doubt had in their special lines as much experience as you had in yours before you were promoted. Knowing that fact, the management still picked you out because they believed you had some of the qualities we have been discussing which make for leadership ... and one of them is that of being a good listener. A little bit ago, I mentioned the paint shop foreman who moved up to general foreman in the plant. His pet trick was about like this. He'd go up to one of the older workers and say, "Look, Jim, they got me down here to sort of keep things rolling all together; but there are a number of spots where I don't know all the answers, and 2 or 3 where I don't know a thing. In your work here you know all the answers, and I'm going to rely on you to help me make this thing go. Maybe I'll ask a question or 2 now and then as to why you do this or why do that, but I'm just looking for information and help. OK?" It works. If you really don't know the answers, the wise boys will very soon find out, and you can't stand on your official dignity and get away with it. On the other hand, by asking for information and admitting



Beorge GORTON Machine Co.

1317 RACINE STREET, RACINE, WISCONSIN, U.S.A. SPECIALISTS IN ENGRAVING, DIE MAKING AND SUPER-SPEED VERTIGAL MILLING your own weakness a bit, you make a friend and also give the other fellow the highest praise in the world . . . asking him for advice.

As far as reading to get your information goes, maybe the public library, maybe the head office would have some helpful books or magazines. Personally. I'd go to the purchasing agent or whoever does the buying of raw materials and equipment for the plant and ask him if his sources of supply don't have some literature on the various things they provide. Most of the big mills and machinery manufacturers either have booklets on their products, or they have advertising folders, or pamphlets of some kind. At the same time it would be a good idea to thumb thru this very magazine carefully. There's a lot of miscellaneous practical information in it. Study the advertisements and pick out some of the likelier looking firms represented and

Accurate SURFACE PLATES
FOR
PROMPT

Lombard surface plates are made of a high-quality close grained, stress annealed semi-steel grayiron, are designed for a minimum flexion with a high degree of precision, and are adapted for use where extreme accuracy is required. Available also with planed and handlapped surfaces.

EXTRA RIGID CONSTRUCTION

Heavy ribbed and three point suspension maintains extreme accuracy indefinitely. Sizes from 14*x18* to 48*x96*.





drop them a post card asking for information.

Above all, I would suggest a note-book: sort of a general record of your observations and the miscellaneous information you pick up. If you continually work with a perpetual "Why?" in the back of your mind, you'll get a lot of answers. If you can jot them down now and then, it gives you a chance to go back later and sift them thru, enabling you to arrive at some definite conclusions.

Not long ago I was talking with a group of younger foremen in a plant in southern Illinois, and one of them happened to mention that in that very plant there had been about 30 new foremen appointed in the last eighteen months, most of them to replace men who couldn't handle the positions. So I asked them what they thought were the reasons for the failure of these other foremen as leaders. Their replies varied, and the causes suggested included practically everything that can be wrong with any of us. However, a few of the more common stand out:

Post Mortems.

Conceit. Not just a good opinion of himself, but the plain garden variety of big-head. He couldn't stand prosperity. There never was anybody who was a foreman and would boss men around the way he could. He was boss and no mistake. He didn't get along very well.

Outside interests. He was a good fellow . . . very definitely hail and well met. Everybody liked him. Even his wife. And three or four other fellows' wives. And all the barkeep's in town. He was a good bowler and the plant ball team is going to miss him at third base. Being precinct committeeman, he made a natural block captain for the OCD, when they could find him. So he was retired to take care of the outside in-



Flexible Shaft Equipment

MORE VERSATILE MACHINES for MORE PROFITABLE WORK



Heavy Duty grinding is only one of many jobs Haskins Flexible Shaft Equipment will do for you at less cost per man and machine hour. Haskins makes 30 different kinds of equipment—but each kind will do many kinds of work. See how you can apply flexible shaft equipment to more jobs—more profitably. Send for Catalog 45. You'll find it full of valuable information covering grinding, sanding, wire brushing, polishing, rotary filing and drilling operations. R. G. Haskins Company, 623 S. California Avenue, Chicago, Illinois.

HASKINS

FLEXIBLE SHAFT

terests. The company executives wanted to use the telephone even during his working hours.

Excitability. Not that he hated anybody in particular, but when something went wrong, you could hear him a block the other side of the steam hammer. He ran around with a pocket full of scraps of paper he used to write everything down on so he wouldn't forget it and then couldn't find the papers until his wife cleaned out his pockets at the end of the week. The army turned him down for emotional instability.

Irresponsibility. He wasn't exactly a buck passer, but it was always some-body else's fault when things went wrong. After all the men in his own department had taken the blame for everything, he went to work on the other foremen. They couldn't all be responsible for his department; so they got a man who would take the responsibility and give everybody a rest. He obtained a position in another firm . . . the men told me he was assembling all the abeyance things are held in.

Ambitious . . . for himself only. And outspoken about it. If he didn't look out for himself nobody else would. He apparently couldn't — and they didn't, after he had said so so many times. Departmental politics turned out to be bad business when Army Ordnance wanted results instead of excuses. He's still working for himself, only he's his own boss now.

Lack of tact in the front office. The "Super" (who by the way had graduated from the same department) didn't know anything about it any more. Times had changed. And when he had a "beef" he went right to the top. That was the only way to get results. If the personnel department couldn't pick men for him any better, he'd go out and get them himself. Those guys up front didn't do anything all day long

but warm a chair anyway; so they ought to have plenty of time to listen to him. Nobody knows who is listening to him now. Maybe his wife.

Lack of self confidence. He wanted to be friends but didn't know how. Some of the tough boys started to ride him and then the whole gang was doing it. He thought they were all against him and didn't know quite what to do about it. The "Super" was after him because production was down and he was afraid to open his mouth to anybody to speed things up. He wasn't too sure of all the technical details in the department, and was afraid he'd lose face if he admitted it: so tried to bluff his way thru it. Which only made things worse; so the gang rode him worse than ever. He guit.

Inability to handle the men. He had plenty of confidence and knew his stuff all right in every way. So much so that he personally supervised and inspected about everything that happened in the place. Somebody cracked that he was fussier than an old maid in a kitchen. So they tagged him "Lady" . . . He also had a temper to help things along. And was a strong believer in the motto about doing a thing yourself if you want it done right. It probably never occurred to him that several of the men under him could perhaps do their jobs if he didn't bother them . . . might even do better with a little praise and trust. They shifted him over to chief inspector. Now he's happy making things tough for the assembly line.

What are the traits that make a good foreman? It's all in the golden rule boys. And they wrote the Bible and a good many commentaries and took 20 centuries to convince most of us that maybe there's something to it after all. And maybe in another 20 centuries we'll begin to use it. Well....

See you all next month.

SHAFTS FOR SPEED SPEED FOR SHAFTS



in d

d

m

at

le

20 at

Which Blade is Yours?

AVOID COST OF REPLACEMENT IN THESE TIMES .

WHICH BLADE IS YOURS?

Here are two blades - one ready to deliver a maximum cut per stroke - the other ready for the scrap box.

Exclusive features on Racine High Speed Cutting Machines prevent early excessive wear on saw blades by oil cushioned control - eliminating costly vibration and chatter,

Each replacement - each inefficient cutting stroke is costly - and will be increasingly so as demands for war production mount.

Get the maximum out of every saw blade - use time proven Racine Metal Cutting Machines and solve your cutting problems.



Write today for Illustrated folders covering our complete line. RACINE TOOL AND MACHINE 1754 STATE ST., RACINE,

RAPINE METAL CUTTING MACHINES



THE Bridgeport TURRET MILLING MACHINE

Rigidity and Flexibility Unparalleled Range

The most difficult milling, drilling and boring jobs are easy with the new Bridgeport. Here are a few of the advanced modern features that make such performance possible.

Angular settings in one plane are achieved by turning the hand wheel which controls the keyed overarm. Turret diameter is 15° with 5° overarm.

Column, knee and table construction are rugged with wide ways and taper gibs for accurate and vibrationless operation. Table, knee

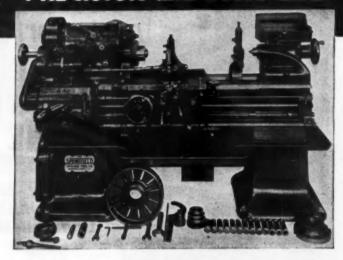
and saddle locks are located in front for easy accessibility.

Graduated dials are 3% in diameter. Anti-friction bearings are used throughout.

Write for full details.

BRIDGEPORT MACHINES, INC.

PRECISION and LONG LIFE



SPRINGFIELD Precision LATHES fill the munitions makers' demands for (1) extreme accuracy and (2) maintenance of this accuracy and long life.

Here are some of the factors that account for the sustaining of the original accuracy built into each Springfield Lathe:

HEADSTOCK...12 speeds...only half of the easy-shifting spur gears mesh at one time. APRON...extra heavy... operates on ball and bronze bearings throughout. TAIL-STOCK...all bearings and bed ways oiled from one well.

The SPRINGFIELD LATHE is an outstanding value for both tool room and quantity production use. Write for Bulletin 162.

THE SPRINGFIELD MACHINE TOOL CO.

Aspects of Modern Milling

(Part II)

By JOHN E. HYLER

UTTERS designed for the milling Of plane surfaces are of helical type when made in the modern way, except in the case of narrow-face cutters less than 1" wide, which are usually made with straight teeth. On the helical cutter proposition, the universal type of milling machine serves itself and all its brothers, for spiral cutting is an outstanding accomplishment of such machines. There are 2 advantages, at least, in using helical cutters. One is that a shearing cut is obtained on the work which makes for a smoother job in its own right. The other is that regardless of the weight of a cut being taken, part of the cutting edges are in working contact with the work at all times, so no vibration or chatter is set up in the cutting action.

The general run of helical cutters, as made for the finishing of external surfaces, are fairly large in diameter, but there is a type of helical cutter which is made to smaller diameters. Because the small diameter will not permit of its being bored to operate

on a standard milling machine arbor. the cutter is made integral with an arbor, and is generally referred to as an arbor-type helical cutter. such a cutter, one can accomplish many different types of internal finishing and end-slotting operations on the milling machine. Blocks of steel may be cut out of the ends of work-pieces, when desired, by feeding straight in at the end with an arbor-type helical cutter for the right distance, then cutting straight downward, then out again in a direction opposed to the infeeding cut. Where there are slots to be cut in the ends of linkage bars and like work, that must be finished to size internally, the arbor-type helical cutter is the kind of tool to use.

The pitch of a spiral as milled into a helical cutter naturally determines the relative amount of shearing action that cutter will have. It follows that for some special jobs where smooth work is far more to be desired than speed, it will pay one to have a cutter with a rather radical helix angle incorporated.



A "SEEING EYE" FOR YOUR SUPER SENSITIVE DRILLING

Sturdy, extremely convenient in operation, precision built for finest precision drilling of holes from .004 to 5/16 dia. Used singly or in multiple units. For production or laboratory.

THE HAMILTON TOOL CO.

The HAMILTON
MUEHLMATT
Super Sensitive
DRILLING MACHINE

Use it to conserve your irreplaceable small drills.

HAMILTON

Machinists-Tool & Die Makers-Sheet Metal Men-Pattern Makers-Get...

FREE SAMPLE TAMMS BLUE LAYOUT DOPE

Speeds layout time on brass, aluminum, copper, tin, stain-leas steel. Won't chip, crack, or flake off. Comes in handy 8 cs. bench type brush-in cans. Also pts., qts., gals., drums. Send for sample now!

Tamms Silica Co. 228 N. LaSalle St., Chicago, IIL



Such cutters may be had to order to suit any given job. It is interesting to note that even in the case of end mills, there are manufacturers who have incorporated more shear into them by means of a more pronounced helix angle, one such maker designating his end mills by the term "shear-cut."

End mills are usually of relatively small diameter, and are made with tapered shanks, except in cases where it is desired to use them in connection with spring collets, when straight shank tools are employed. Such tools are nearly always righthand with regard to rotation, the lefthand endmills may be had on special order. Some firms make them in both straight-tooth and spiral types, and when the straighttoothed end mills are used, they are usually of smaller diameter. End mills of special form, having only 2 cutting tips, are used for slotting, and slotting jobs may be performed in solid metal quite rapidly at the milling machine by their use.

End mills of the shank type, as mentioned, are much to be preferred to the old-time fishtail cutters used for grooving and slotting, and they are obtainable either right or left hand. A great deal depends, in the operation of any end milling cutter, on the proposition of keeping it well sharpened and in top condition. The best place to obtain specific information on methods of sharpening them is from the manu-

facturers. In fact, one outstanding maker of end mills furnishes a sharpening fixture for the purpose, that can be used in connection with any grinder having a flat table. In these days when the demand for tools is extreme, and shortages loom, it becomes doubly important to have adequate means at hand for taking good care of what we have.

A milling tool closely related to the slotting tools mentioned, is the standard T-slot cutter, so much used in the slotting of machine tables and similar work. These, of course, are available in all standard sizes, in either carbon steel or high speed.

It should be mentioned that end mills of the kinds generally used are not made in the shank types as a rule in diameters larger than 1-1/2". end milling cutters of larger diameter are required, they are furnished in a type designated as a shell end mill. Milling cutters larger than 11/2" in diameter may easily be bored for mounting on an arbor of substantial design. The same arbor will serve a considerable number of shell end mills, so that a material saving is represented by making them in this way. Makers of one type of end mills are usually prepared to furnish the others also.

Key seat cutters, usually held in a collet, are made with straight shanks in all necessary sizes by representative makers of milling cutters in general.



Valso stands for VERSATILITY.

Arter Rotary Surface Grinders give you wide versatility—precision surface grinding on a wide variety of surfaces.

Are you using your Arter Rotary Surface
Grinders to their full capacity?

After grinding engineers are always at your service—to help you gain production-plus, which is the all-important need of the hour.

APTER CRINDING MACHINE COMPANI

ARTER GRINDING MACHINE COMPANY

WORCESTER, MASSACHUSETTS . U.S.A.

OPEN THE WAY TO GREATER PROFITS

BUTTS AND CONTINUOUS LENGTHS — For GUARDS — CABINETS — CASES — BOXES — LUGGAGE WRITE FOR CIRCULAR

S & S MACHINE WORKS

4839 WEST LAKE STREET

CHICAGO, ILLINOIS

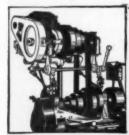
One thing that has been particularly profitable is a method of imparting a curved tooth form to the teeth on a keyway cutter, as developed by one manufacturer. The tooth engages the cut at its center portion first, so that a shear is imparted to the cutting action, tho no spiral is involved and no end thrust operates upon the cutter.

With reference to Woodruff - type keys and the milling of key-seats for them, one firm produces special keys of this type, having a flat bottom, so that the keys cannot circle-slide or roll in their seats, thereby making one end higher than the other on the reveal and causing trouble in the mounting of keyed parts. So that their keys may be properly seated, without any question, they also furnish cutters to mill seats for their keys.

Side Milling Cutters

The designing and production of efficient side milling cutters have had

much to do with high rates of production on many types of milling jobs. A side milling cutter mounts on the arbor of the standard horizontal or plain miller, but there are cutting edges on the sides of the teeth, so that one can mill down over the edge of a piece of material, producing a milled surface at right angles to the surface of the milling machine table. Consider, in this connection, that with a helical milling cutter of surfacing type, just the length that is required in the width of a milled bar, sandwiched in between two side milling cutters (one right and one left-hand) on the milling machine arbor, it is possible to mill three sides of that bar at one pass of the work. Consider, further, that by using combinations of side milling cutters, surfacing cutters, and interlocking cutters (the latter having been dealt with in Article D of such different diameters as may



Busy people want QUIET

Get it in a motor drive—install Remcos. Motor takes hold gradually by slipping belt—simple friction-clutch action. No clash of metal-on-metal. Shockless speed changes made without removing tool from cut in most cases. Less down-time—more out-put. No tool marks. No other drive like the Remco. Hundreds of satisfied users testify to this fact. Investigate—write! Remco Products Corp., State St. at R. R., York, Pa.

REMCO MOTOR DRIVES

for LATHES, SHAPERS, DRILLS, MILLING MACHINES, etc.

WHO SELLS THEM?" means more

to you than "HOW MUCH?"



.. It pays to buy

Landis, Norton, Cincinnati Nibs



ASCO Shaped Diamond Tools fo Turning, Boring, Facing

Shaped Tools • Ascopoint Dressers Valve Refacers • Impregnated Dressers • Diamond Pencile • Phonopoints Glaziers' Tools • Tungsten Diamond Wheels • Wire Dies • Saw Blades Core Bits • Diamond Powder.

You will never be disappointed in buying diamond tools if you buy only from established, experienced concerns-in business to stay. It is to their interest, as well as yours, to advise you truthfully on the quality and correct application of their products.

Don't buy "bargain" diamonds from unknown vendors. The only true bargain is the best quality diamond for your particular need, recommended and set by experts to provide the utmost in production.

Anton Smit & Co., Inc., one of the world's largest industrial diamond firms, has, for over 30 years, been supplying America's leading industrial plants with diamonds and diamond tools. An ASCO Diamond tool pays for itself in a very short time. Consult us on your needs.

Write for literature.

ANTON SMIT & CO

LEONARD J. A. SMIT, Managing Director

333 West 52nd Street, New York, N. Y. — Tel. Columbus 5-5395

Affiliated Companies:

ANTON SMIT INDUSTRIAL DIAMOND CO., INC. Detroit, Mich. Plant & Office: 8100 Lyndon Avenue - HOgarth 2074 ANTON SMIT DIAMOND TOOLS, LTD.

Windsor, Ont. Plant & Office: 1323 Tecumseh Rd. E. - WINDSOR 3-9155 Toronto Sales Office: 100 Adelaide St. W. - WAVERLY 3750

SAVE

MAN POWER. TIME, COSTS

ADD TO

SPEED. PRODUCTION. ECONOMY

PORTELVATOR PORTABLE ELEVATING TABLE

Move things from job to job on anti-friction bearings and casters. It lifts, carries, supports overhangs. Capacity up to 20 tons.

Dept. B-9

HAMILTON TOOL CO. Ninth and Hanover Streets.

HAMILTON OHIO



be pre-determined, it is possible to make cuts of all kinds in large numbers, in any desired combination, at one pass of the work. Side milling cutters have been a tremendous contribution to the versatility and the productivity of the plain horizontal miling machine.

But the matter does not end here. for angular cutters of all kinds are to be had in the same way, being carried by milling cutter specialists in various standard angles. Some are sin-

gle-angle cutters, and some are double-angle. Double-angle cutters are presumed to have the same angle of inclination each way, unless they are otherwise specified. Some firms carry them with an included angle of 45, 60 or 90 degrees. Such cutters are usually of relatively small diameter, unless they are made up "special."

The fly cutter, tho it cannot be called a production tool, and tho its use is crowded into a corner as closely as possible in these days because of its relative inefficiency, nevertheless deserves passing mention. Often it gets the milling machine operator out of a hole when he must produce a cut or a shape for which he has no other cutters. It is well, therefore, to have one or more fly cutter arbors at hand, so the operator may fashion a fly cutter. or have one made up by the tool room, in case of emergency. If the miller does work for an experimental department, the need for fly cutters and fly cutter arbors will be even greater. Fly cutter arbors (and in fact milling machine arbors, adaptors, collets and spring chucks of all necessary kinds) may be had from milling machine specialists.



Other Special Cutters

You will appreciate that in the spiral milling of spiral milling cutters themselves, milling tools of a special form will be needed. If one has a universal miller in either the shop or the tool-



FOR YEARS — it has made no difference how "tough" the assignment, (CJB) Double Row Ball Bearings have proved that they are "Built to Take It."

- CJB deep grooved races—maximum number of balls and solid type ball separators—are design features contributing to the ability of these bearings to take it year after year.
- NOW that's mighty important to designers, engineers and manufacturers of heavy equipment who want ball bearings that can carry heavy

radial as well as severe thrust loads or any combination or both!

- Single-Row and Self-Aligning Ball Bearings as well as the Double-Row are in continuous production at Ahlberg in standard sizes.
- To assist bearing users Ahlberg maintains a competent engineering staff in 22 strategically located branches. The direct use of these facilities is suggested.

 WRITE US FOR THE LOCATION OF AMLIBERG BRANCH NEAREST YOU





LIVE CENTERS

With IIDISAM

Get more work, quicker, out of lathes, millers, grinders, etc. with IDEAL Live Centers. They rotate with the work, therefore permit heavier loads - faster speeds - deeper cuts. The radial load is carried by a high precision ball bearing, and thrust load absorbed

by a taper roller bearing. All parts are hardened and ground.

TRIPLE DUTY

Three Inter-Center Pieces (illustrated (illustrated be-low) for all kinds of centered and uncentered work. Save set-up time.







OTHER PRODUCTION SPEEDERS



FREE-Machine Tool Accessory Catalog

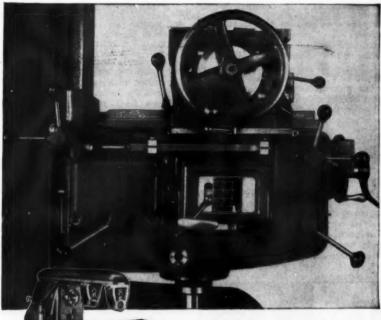
IDEAL COMMUTATOR DRESSER CO.

41 Park Ave., Sycamore, Illinois Sales Offices In All Principal Cities In Canada: Irving Smith, Ltd., Montreal, Quebec 1441 Park Ave.,

room, together with the accessory equipment needed for the purpose and the time, milling cutters of different types may be produced in your own shop. Again, cutters designed for the milling of flutes in reamers, and the cutting of grooves in taps, are available from milling cutter manufacturers. Then, aside from such tool-making specialties, one may purchase milling cutters of corner-rounding type in either right or left hand items, or, milling cutters for producing a full-rounded edge. These are so-called concave cutters, and are made with a straight portion at either side of the concave so that one can mill across a surface and leave a fully - finished half - round standing on the work. The opposite type of cutter may also be had, known as a convex cutter, and it is used for milling female half-circles, and flutes of different kinds. Both concave and convex types may be had from representative makers in sizes varying from 1/8" up to 1" diameter, with reference to the cut produced, and they may be had in different cutter diameters as well.

The Rose Mill

It is also possible to work out female half-round cuts on a vertical type of miller with a type of tool known as a rose mill. This is a hemispherical cutter with teeth milled all around its surface. However, such cutters are not so much used for long half-round cuts as they are for short round channels, either straight or curved, in dies, molds and similar work. This type of cutter is also employed for producing spherical ball - joint seats in various types of mechanisms. Various special cutters are available for the vertical miller, which allow the making of special cuts to considerable depth in working out dies and molds, as well as for cuts on the surface or those closely confined to the surface. One builder of tools makes an unusual facing head which can be applied to the spindle of





On June 20th, Van Herman was ewarded the Army and Navy E, in recognition of the company's war preduction record.

All Power Controls are RIGHT AT YOUR FINGERTIPS on Van Norman Horizontal Millers

Centrelly, conveniently grouped together are all the power-centrols of Van Norman Herizontal Millers. And their proper use is never confusing to the operator. For whether he is at the front or back of his machine, he has only to move the levers in the direction in which he wishes to travel the table, knee or saddle. And to change to any of the 18 feeds, he has only to move the single lever-selector to the desired feed indicated on the direct-reading diel. This quick ease of operation enables Van Norman's No. 2-S and 3-S Horizontal, No. 26 and 36 Ram type, and No. 3-V Vertical medels to establish new horizons of accuracy and output in horizontal milling operations.

VAN NORMAN

MACHINE TOOL COMPANY SPRINGFIELD, MASS., U.S.A.

the miller, the head having a singlepoint cutting tool which travels radially in the head as the facing progresses. Tool travel may be from the outside toward the center or vice versa. When it is considered that facing heads of this kind may be had in sizes as small as 6" diameter, and all the way from that up to 46", it can be seen that considerable facing scope is available by this method. Such heads are applicable to other machines also.

On the other hand, very light cuts over the surface may be made with tools that are quite delicate, if one uses care or employs a small machine for the purpose. One maker of an outstanding line of rotary files and burrs, for instance, has been pleased to designate them as "midget" millers. Such, indeed, they are. It so happens that this particular manufacturer not only sells, but also services or re-sharpens these little cutters for the trade. The

same manufacturer. I understand, also makes different tools used for die work and similar jobs on the vertical miller, a case in point being so-called cherrying tools.

As a final word on tool types before going into a consideration of milling cutter materials proper, I would mention the hollow mill. The hollow mill is a shank-fitted tool, usually provided with 3 or 4 blades, which is hollow in the center and has radially adjustable blades. As built by one firm, however, a roughing hollow mill is provided which has 3 cutting blades, and also a finishing hollow mill which is fitted with 2 blades, with 2 back rests arranged diametrically opposite to the blades.

One of the best things I have seen in the hollow mill field, however, is a type of tool with a built-in micrometer dial for adjusting the blades, of which there are 4. Hollow mills of this type naturally allow one to work very closely, with a minimum of toolsetting trouble, and they are available in a number of sizes, the entire range making it possible to produce cylindrical finish cuts at any point between 1/32" and 2" diameter.



Helical types of milling cutters, including the small-diameter arbor types of cutters, are made by most milling cutter manufacturers, including Brown & Sharpe Mfg. Co., Providence, R. I., Barber-Colman Company, Rockford, Ill., Falcon Tool Co., Detroit, Mich., Union Twist Drill Co., Athol, Mass., Pratt & Whitney, West Hartford, Conn., Illinois Tool Works, Chicago, Scully-Jones & Co., 1901 S. Rockwell St., Chicago, Continental Tool Div., Excello Corp., Detroit, Michigan Tool Co., 28432 Bulter St., Detroit, Michigan Tool Co., 27171 E. McNichols Road, Detroit, Furnam Tool Co., 2923 Charlevoix Ave., Detroit, Kearney & Trecker Corp., Milwauke, and Geo. Gorton Machine Co., Racine, Wis. and Lovejoy Tool Co., Springfield, Vermont. and Lovejoy Tool Co., Springfield, Vermont.

The manufacturer of end mills who seems to have incorporated a radical helix angle when cutting his mills, and who designates them as "Shear-Cut," is the Progressive Tool & Cutter Co., Ferndale, Michigan.

End mills in general, both shank and shell type, are made by McCrosky Tool Corp., Meadville, Pa., Brown & Sharpe Mig. Co.,



PICKS up flat-surface materials and feeds them into punch presses. Keeps operator's hands out of "danger zone". Reduces risks, layoffs, time and money losses.

Simple and easy to operate. Place cup on work, pull trigger to pick up—release trigger to drop piece held. Strong vacuum in cup holds in material to be fed into press. Single or double-cup types.

Other Littell products include Air-Blast Valves, Mechanical Pickers, Roll Foods, Dial Feeds, REQUEST Straighteners, Automatic Center-BULLETINS ing Reels, etc,

4153 RAVENSWOOD AVE. CHICAGO ILL

Accurate, Speedy and Economical thread cutting

MODERN ROTARY TYPE SELF-OPENING DIE HEADS

Least number of parts

Simplest construction.

Hardened and ground throughout.

Cuts close to shoulder threads without special chasers.



"WA" Die Head-Ring type for opening and closing.



Easily adjusted for thread size.

Requires no springs to operate movement of chasers.

"WB" Die Head-Trigger trip type.

Made in four sixes having capacity for cuttings straight threads from %* to 1%* straight or taper pipe threads from %* to %*

MODERN TOOL WORKS

Division of Consolidated Machine Tool Corporation ROCHESTER, NEW YORK

Providence, R. I., Progressive Tool & Cutter Co., Ferndale, Mich., Barber-Colman Co., Rockford, Ill., the Gammons-Hoagland Co., Manchester, Conn., Putnam Tool Company, Detroit, Mich., Union Twist Drill Co. of Athol, Mass., Weldon Tool Co., Cleveland, O., Geo. Gorton Machine Co., Racine, Wis., Pratt & Whitney, West Hartford, Conn., Gatring Tool Co., Detroit, Tomkins-Johnson Co., Jackson, Mich., Severance Tool Co., Cleveland.

The slotting type of end mills mentioned are made by Brown & Sharpe Mfg. Co., Providence, R. I., and others.

The sharpening fixture for end mills, adaptable for use with any grinder having a flat





This unique patented expanding internal gage is found on machines and inspection tables in the airplane, ordnance, automotive, electrical and other industries, where high precision of bores is required. Shows ACTUAL SIZE of hole, and reveals irreqularities such as out-of-round, tapers, etc. Automatic 2-point gaging, equally precise in untrained or expert hands.

Request Bulletin 27

THE COMTOR CO.

62 Rumford Ave., Waltham, Mas

table, is made by The Weldon Tool Co., Cleveland, Ohio.

T-slot cutters as mentioned are made by Brown & Sharpe Mig. Co., of Providence, Pratt & Whitney, West Hartford, Conn., Barber-Colman Co., Rockford, Ill., Severance Tool Co., Saginaw, Mich., Excello Corp., Continental Div., Detroit.

Key seat cutters are available in all standard sizes from Brown & Sharpe Mfg. Co. Providence, R. I. The special type of keyseat cutter which incorporates an easy-to-grind curved tooth face, is one made by Aber Engineering Works, Inc., Waterford, Wisconsin. The firm which furnishes special, flatbottomed keys of Woodruff type, and also special key-way cutters to match their own keys, is The Whitney Chain & Mfg. Co., Hartford, Conn. Keywary cutters are also made by Quality Tool Works, Market St., Waukegan, III., Pratt & Whitney, West Hartford, Conn., Morton Mfg. Co., Muskeyan Heights, Mich., and Consolidated Machine Tool Corp., Rochester, N. Y.

Side milling cutters are offered by Barber-Colman Co., Rockford, Ill., Brown & Sharpe Mfg. Co., Providence, R. I., Genesse Tool Co., Fenton, Mich., Victor Machinery Exchange, 251 Centre St., New York, N. Y., Standard Tool Co., Cleveland and others.

Angular cutters of the various types mentioned, fly cutter arbors and the other necesary arbors, adaptors, collets and spring chucks for various milling machines, as well as tools for making spiral milling cutters, tools for flutes in reamers, grooves in taps, and concare, convex and corner-rounding cutters, are all available from Brown & Sharpe Mig. Co., Providence, B. I., Pratt & Whitney, West Hartford, Conn., Illinois Tool Works, Chicago, Barber-Colman Co., Rockford, Ill., Excello Corp., Continental Div., Detroit, Victor Machinery Exchange, 251 Centre St., New York, N. Y.

Believe the rose mills may be had from Severance Tool Co., Saginaw, Mich. I know that this firm makes cherrying cutters, and they furnish the rotary burrs and files mentioned, which they also service or re-sharpen. M. A. Ford Co., Davenport, Ia., Charles L. Jarvis Mig. Co., Middletown, Conn., Pratt 6 Whitney, West Hartford, Conn., Grobet File Co., 3 Park Place, New York City, Martindale Electric Co., Cleveland, Ano Equipment Corp., Bryan, O. and Hamilton Tool Co., Hamilton, O., all offer rotary files.

The facing heads mentioned, incorporating a radially-travelling tool, are made by the Mummert-Dixon Co., 120 Philadelphia St., Hanover, Pa.

Hollow mills furnished in roughing and finishing models as described, are available from Brown & Sharpe Mfg. Co., Providence, R. I. The hollow milling tool mentioned as incorporating a built-in micrometer dial for quick and accurate setting, is made by Carl Wirth & Son, 1625 Clinton Ave., N., Rochester, N. Y.



give the correct-fit-of-wheel for the job that will win your production

Literature including 71 recommended specifications for both heavy and portable Snagging Wheels is available. Write us.



ABRASIVE PRODUCTS CO., WESTBORO, MASS. U.S.A.

COMPENSATING TOOL HOLDER

Produces true and accurate holes by correcting machine tool misalignment on hand screw machines, automatic screw machines; tapping and drilling machines of all kinds, and multiple spindles.

Available in stock are five standard sizes of holders with taper or straight shanks with capacities up to five inch tool diameters. Prompt make-ups on larger or special holders are easily accomplished and our engineers are ready at all times to assist you in solving your special problems.

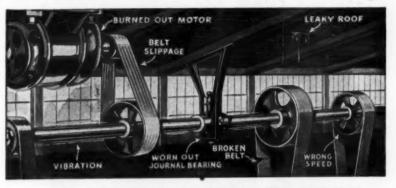
SEND FOR BULLETINS ON ALL OUR UTILITY TOOLS

THE J. C. GLENZER CO.,

4465 EPWORTH BLVD. INC. DETROIT, MICHIGAN



AVOID these causes of delay



with TORQ-QUA-MATICS

TORQ-QUA-MATIC Drives on your machine tools will eliminate the delays associated with overhead shafting, and will help to increase your production. The ease of operating and the stamina of TORQ-QUA-MATICS is the answer. The four-speed selector is so conveniently located that operator reaching motion is cut in

half over power shaft methods. This means less fatigue—more production with the same effort.



TORQ-QUA-MATICS are well designed and well built. A check-up on 3849 TORQ drives—in service for three years—revealed a total factory repair part cost of only \$14.00.

Avoid delay, speed up offense production, order TORQ-QUA-MATICS for your equipment now. You'll do a better, faster job today and a more profitable job tomorrow.

SIZES 1 TO 15 H.P.

At slight additional cost to cover overtime labor TORQ-QUA-MATICS can be delivered in days instead of weeks.

THE TORQ ELECTRIC MFG. COMPANY



WHEN CONSIDERING FORM CUTTERS, NOTE THE FOLLOWING:

There are an infinite number of shapes, both symmetrical and irregular in outline, which can be milled efficiently and economically with Midwest Form Relieved Cutters. These cutters, provided with eccentric relief behind the cutting edges, always maintain the original outline of form when they are sharpened by grinding the faces of the teeth. However, conditions are so varied in the application of form cutters, no definite rules can be offered for making a proper selection as to type and form. When considering form cutters, send a blueprint of part to be milled; outline the cutter on the surface to be milled; furnish all dimensions of the form shown, with tolerances; specify arbor diameter, keyway size, and rotation. On unsymmetrical forms, designate below the outline, rotation, as "bottom going" or "bottom coming." Whenever possible, form cutters should have undercut teeth, the degree depending upon operating conditions. When sharpening a form cutter, the amount of undercut which is marked on the cutter should be preserved, since the form was corrected for this exact amount of rake . . . Other examples of Midwest Form Relieved Cutters may be found in Midwest's catalog 17 of Precision Metal Cutting Tools.

Your Security and Freedom depend on your Country Winning the War. There is no alternative. Your Country needs your Fighting Dollars for Victory, Invest them Now in United States Bonds and Stamps.

END MILLS . SLEEVES . COUNTERBORES . SPECIAL TOOLS . DRILLS REAMERS . FORM TOOLS . CARBIDE TIPPED TOOLS . ADJUSTABLE HOLDERS

MID WE ST PROCESOR

METAL CUTTING TOOLS

MIDWEST TOOL & MFG. CO. - 2362 W. JEFFERSON AVE. - DETROIT, MICHIGAN

Dry Versus Wet Grinding

By J. R. LONGWELL*

WITH the tremendous increase in usage of carbide tools to speed production under the impetus of the war program, the problem of establishing proper grinding techniques for such tools has become of immediate importance. Incorrect grinding may sacrifice a considerable portion of the increased output per machine-hour and per man-hour made possible by carbide tools, as a result of more frequent shutdowns for tool changes with resultant loss of time.

Among the major problems to be decided in each plant in this connection, is whether carbide tools are to be ground wet or dry. It is entirely feasible to grind carbide tools satisfactorily by either method. Each has its own peculiar advantages and disadvantages. The decision as to the procedure to be followed will have to be decided in each plant on the basis of which practice presents fewer obstacles to the attainment of proper grinding practice.

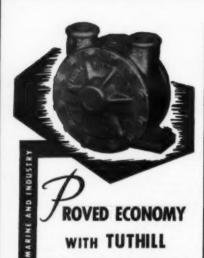
To assist in the determination, I have listed in the accompanying table, the major pros and cons with respect to both methods. Frankly, based on our own field experience over the past 14 years, we at Carboloy favor dry grinding—not because of any intrinsic superiority but because from a practical standpoint, it has been found to present fewer difficulties to the obtaining of properly ground tools.

I am referring, of course, to "hand" grinding of tools. For machine grinding, where more heat is generated, where there is inevitably greater contact between tool and wheel, wet grinding has obvious advantages particularly since there are no "human element" limitations on the amount of water to be used to keep tools properly cooled and prevent quenching. In addition, the somewhat longer wheel life possible with wet grinding presents obvious advantages in machine grinding without the counter-balancing disadvantages experienced in grinding "wet" by hand.

The difficulty in applying wet grinding to the refinishing of carbide tools on hand grinders lies primarily in the quantity of water to be used. From this standpoint, field experience has repeatedly demonstrated that the tendency is for the operator to attempt to use too little water in order to keep from getting wet.

With carbide tools, using a small amount of water is decidedly worse than none at all. You have to go to one extreme or the other—bone-dry grinding or deluge-grinding. Lack of appreciation of this factor has even led a number of companies at one time or another to reject completely all carbide tools:—they wouldn't stand up

*Factory Manager, Carboloy Co., Inc.



Low first cost. Low power consumption. Negligible maintenance. In many ways, Tuthill Model C general purpose pumps save you money while serving you dependably. The Model C is a positive displacement, internalgear, rotary pump—built in 8 sizes from 1 to 200 g.p.m. at pressures up to 100 p.s.l. on non-corrosive liquids. Simple, compact and durable. Operates in either direction of rotation with equal efficiency. Available for direct drive or belt drive. Stripped models and V-belt units also available.

GENERAL PURPOSE

PUMPS

Write for literature on Model C pumps.

Tuthill PUMP COMPANY

on the job after they had been wet ground since too little water was used.

From a practical standpoint, field experience has continuously demonstrated that operators do a better job of "dry" grinding than "wet."

Irrespective of the method to be used, correct grinding of carbide tools is not difficult to learn. It is true, however, that the best results have been and are being obtained by centralizing all tool grinding instead of leaving such grinding up to individual machine operators.

At Carboloy, where a school is maintained to teach men from various plants the fundamentals of carbide tool maintenance and application, it has been found that a tool grinder can be trained to be a good carbide tool grinder in a few days. The accompanying illustration and simplified instructions cover the basic fundamentals of correct carbide tool grinding procedure.

Recommended Procedures
For Wet or Dry Hand Grinding

ROUGHING—Using 60 grit silicon carbide straight wheel.

1—Rough Top Face. Rough grind top face of tool, leaving about 1/32" land, at the cutting edge.

2—Rough Front Relief (Front Clearance) Set table at 4° greater than finished relief angle desired at the cutting edge; rough grind the front secondary relief, leaving about 1/32" land at the cutting edge.

3—Rough Side Relief (Side Clearance) Leaving table at 4° greater than finished angle desired, rough grind the side secondary relief, leaving about 1/32" land at the cutting edge.

FINISHING—Using 100 grit crown face cup wheel or 100 grit diamond wheel

4—Finish Top Face. Set table rest at the finished top face angle desired. Finish grind top face of tool.

SERVING ARMY . NAVY



Several years ago, Millers Falls engineers went to work on an idea that's paying the country generous dividends today . . . dividends in part money, but more important, in desperately needed steel, transportation, storage space, handling, and paper work. The idea was just this:

A full 50% of the potential cutting power of every hack saw blade was wasted because only one edge of a blade was a cutting edge. If teeth could be put on the second edge, there would be savings in everything but the actual milling of the teeth. Prime obstacles were drag and wear on the trailing edge. Intensive experimenting solved the problem with a special "set" and special heat treating. After thorough tests, the new two-edged blade was put on the market at a price only 50% above single-edge blades.

That was 18 months ago. Now Millers Falls "Double-Life," the high-speed molybdenum alloy blade, is proving its value. In almost every plant where Double-Life is given thorough tests, it becomes the standard specification for machine sawing.

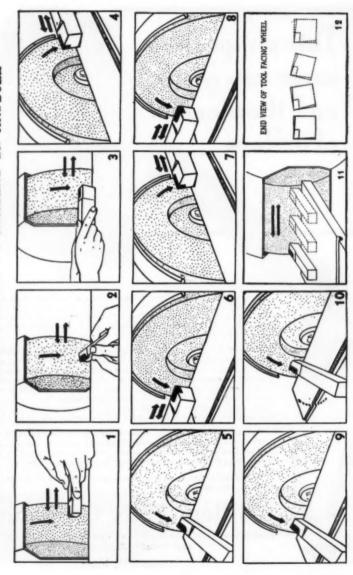
This simple idea is saving America thousands of dollars and tons of vital steel.

Millers Falls Company

Manufacturers of Fine Hack Saws, Precision Tools, Hand Tools, and Portable Electric Tools

Greenfield, Mass.

ILLUSTRATION NUMBERS REFER TO NUMBERS IN ARTICLE



THE Cleveland NO. 1 VERTICAL MILLING MACHINE

Write now for descriptive folder

Everybody seemed to went it - and so we designed it. with these and other features:

(1) Big, hushy pindle of the comment of the comment of the contract of the comment of the commen

(4) Hand wheel and lead ia) risus wheel and lead for screw on spindle head for screw on spindle helds lot spindle speeds.
Changes of spindle speeds.

(1) It leads and It speeds to broaden production track.

(2) All load screws and feed gears mounted on Timken bearings for smooth, quiet running and longer life.

Overload protection on all motors to prevent motor failure and result-ant breaks in production.

(3) Ample coolant sump in base. (Pump optional.) Longitudinal feed, 18"; cress travel, 19½"; vertical travel, 16". Table working surface, 8"x 32". Cutter capacity, 1½,6" to 23½" mills. Spindle speeds: two optional ranges of 12 cach, 190 r.p.m. to 1800 r.p.m. and 200 r.p.m. 10 3800 r.p.m. Slight extra: Stearns brake to stea ndle motor instantaneous h

fast, powerful, rugged, accurate, the Cleveland No. 1 Milling Machine suits well the requirements of tool rooms, die and mold shops, and

production plants. Bulletin.



SOMMER & ADA

COMPANY

Custom-Built EQUIPMENT FOR MANY PURPOSES

Scientific Production Spells Superiority





There are a lot of ways to make diamond tools . . . but there's just ONE way to make them RIGHT! The proof is in the performance. It costs no more to get the exclusive advantages of our "Oxide-Free" process, providing superior quality to meet the unprecedented demands of modern war production.

★ Write Dept. H for latest catalog and prices.

Obrasive
DRESSING TOOL CO.
DETROIT MICHIGAN

- 5—Finish Front Relief (Front Clearance) When continuing from Operation No. 4, reverse motor and use other side of wheel so that wheel will revolve against the cutting edge of the carbide tip. Set rest at finished relief angle desired. Finish grind front relief of tool.
- 6—Finish Side Relief (Side Clearance) Leaving table rest at finished relief angle desired. Finish grind side relief of tool.

LAPPING—Use 220 grit diamond wheel or a silicon carbide wheel.

(Advisable on tools used for precision boring, facing and turning and for tools used for machining aluminum.)

- 7—Top Face. Set table rest at finish top face angle desired; lap the top face. (Note: When grinding on top face is necessary, this should always precede grinding on side or front relief).
- 8—Side Relief. When continuing from Operation No. 7, reverse motor and use other side of wheel so that wheel will revolve against the cutting edge of the carbide tips; that is, from tip to shank. Set table rest at finished relief angle desired (usually 1° less than under Operations 5 and 6) and lap the side relief.
- 9—Front Relief. Leaving table rest at finished angle desired, lap front relief.
- 10—Finish Radius. Leaving table rest at finished angle desired, lap radius on nose of tool. Using light pressure, slowly describe a free hand arc. If necessary to repeat, remove tool to different position on wheel.
- 11—KEEP THE TOOL MOVING BACK AND FORTH ACROSS THE WHEEL AT ALL TIMES WHILE ROUGHING, FINISH GRINDING AND LAPPING.

COMBINE Speed WITH Precision IN TAPPING

THE new Bakewell Radial Tapping Machine, with its patented lead screw control, offers precision performance that taps Class 3 and 4 gauge fits in any material from plastics to alloy steels ... It's precision that eliminates costly rejects—saves more costly delays.

And speed? You gain it by bringing the tap around the work, instead of the work around the tap—from the hydraulic elevating ram, the rigid yet flexible radial arm, the free floating tapping head... These and other exclusive features assure a combination of speed and precision

that will help you meet war production schedules ahead of time.

Also made in rigid spindle types No. 1 and 2. Capacities: 4-40 to 2 inches in steel.

Send for catalog

Bakewell MANUFACTURING COMPANY 2427 EAST FOURTEENTH ST. * LOS ANGELES, CALIF.

12—KEEP THE TOOL ROCKING DURING THE ROUGHING AND FINISHING, AS ILLUSTRATED.

Summary—Dry Hand-Grinding Advantages

- 1—The temperature rise in the tip is more nearly uniform.
- 2—Using recommended technique and keeping the tool in motion continuously, the temperature rise is low provided the area of contact with the wheel is kept at a minimum.
- 3-Eliminates possibility of too quick cooling of tip.
- 4—Silicon carbide wheels remain more nearly in balance since water is not absorbed.
- 5-Operator can see just what he is doing at all times.

Disadvantages

- 1-Dust.
- 2—Inadequate exhaust systems sometimes found in use, do not remove all the dust.
- 3—Wheel life, using the open bond wheels, is slightly less than when wet grinding is used.

Summary—Wet Hand-Grinding Advantages

- 1-Tool shank remains cool enough for a man to handle comfortably.
- 2—Dust is carried away by the water. Eliminates dust control problem where no exhaust system is provided.

Allen Power Bench Type Punch Press



A Small punch press for small work.

Height 17½". Base 8½x8½". Flywheel 10° D. Wt. 28 lb. Stroke ¾" Capacity soft iron ¾"Dx½s" Weight 120 lb. Power required ¼ to ½ H.P.

Price \$125.00 Circular on request.

Alva F. Allen. Clinton, Mo.

3—A wheel one grade harder can be used for safe grinding, usually resulting in reduced wheel wear if the volume of water is sufficient.

4—Speed for safely grinding carbides may be increased slightly if the volume of water is sufficient.

Disadvantages

- 1—The temperature rise in the carbide tip, caused by the cutting action of the grinding wheel, is usually high enough at the cutting edge to cause the water which reaches the cutting edge to vaporize rapidly and keep the water back. This causes intermittent heating and quenching of the tip, especially when the volume of water is insufficient.
- 2—When water is applied in sufficient volume to do a satisfactory job of cooling, the operator cannot see what he is doing.
- The operator is drenched when ample water is applied.
- 4—The floor around the machine is wet.
- 5—The operator, in order to be comfortable, reduces the water supply below a safe minimum. This results in checked or cracked tips due to alternate heating and rapid quenching of the tip. This rapid quench is made when the tip itself is not at a uniform temperature thruout.
- 6—The open bond silicon carbide wheels used for grinding carbides absorb water and this usually causes an "out-of-balance" wheel.
- 7—Frequent cleaning of tank is required to prevent rapidly accumulating sludge from causing pump trouble.
- 8—Tools must be wiped off before tool angles, radii, etc., can be checked.

"Keep 'em Flying"
Buy U. S. War Savings
Bonds and Stamps



WYCO Flexible Shafts have protected cores

With the WYCO Non-Metallic Innerliner no metal can touch the core of a WYCO Flexible Shaft. This patented innerliner of graphite impregnated vulcanite fibre not only prevents the frictional wear of metal-on-metal and adds materially to the life of these shafts, it also assures smoother, cooler running shafts and reduces vibration. You never have to "fight" a WYCO shaft regardless of size.

Equipped with standardized interchangeable parts, couplings and fittings, WYCO Flexible Shafts are available not only on the complete line of WYCO Flexible Shaft Machines, but are also available as replacement shafts for all makes of equipment. They can be readily attached to any standard motor. Most advanced in engineering, they are lower in price because they are produced by quantity production methods. Compare prices—we guarantee quality.

Immediate delivery on high priority orders.

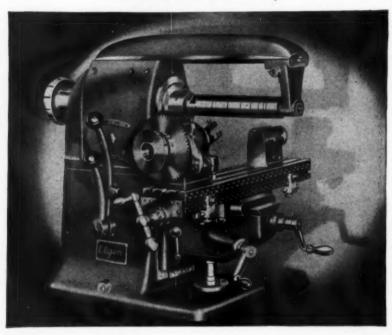
Write for Catalog.

WYZENBEEK & STAFF, Inc.

838-844 W. Hubbard St.,

Chicago, U.S.A.

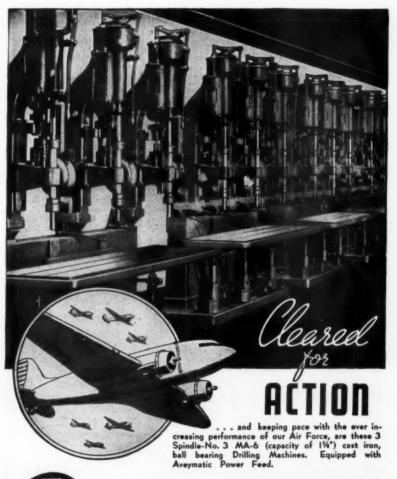
ELGIN



Precision BENCH MILLING MACHINES

ELGIN TOOL WORKS

1772 BERTEAU AT RAVENSWOOD AVE. - CHICAGO, ILL



THE AVEY DRILLING MACHINE CO.
Cincinnati, Ohio, U. S. A.

DRILLING
MACHINES

3 MINUTES 10 SECONDS TO REAM 25 HOLES



↑ 25 15/16" HOLES through 1½" of steel plate in 3 min., 10 sec., thanks to high sustained speed and rugged construction of CP Hicycle Reamers.

15/16" HOLES REAMED IN TWO 3/4" SHIP PLATES

CP Hicycle Cuts Reaming Time

PHILADELPHIA (CP)—Just 190 seconds were needed to ream 25 holes, 15/16" diameter, through an inch-and-a-half of metal in two ¾" ship plates, in a shipyard using CP Hicycle Electric Reamers.

The CP Hicycle line includes Reamers, Drills, Screw Drivers, Nut Runners, Tappers, Grinders, Sanders. All have highest sustained speeds and lowest maintenance costs of any portable tools. Write for complete data.

CHICAGO PNEUMATIC

General Others & E. 48th St., New York, R. Y.



← 19" ARMOR PLATE CHIP from 1.9/32" hole drilled through 2½" plate in 4½ minutes. Length of the chip shows the lack of vibration and high sustained speed, characteristic of all CP Hicycle Electric Tools.

A ONE OF FIVE MODELS of Hicycle Electric Angle Grinders and Sanders. Because of the uniform speed of Hicycles, grinding wheels last longer.

↑ 1/4" HOLES IN 5/8" steel castings, an easy job for this CP Hicycle Electric Drill. Hicycles are designed for continuous, heavy duty.



ELECTRIC TOOLS

ALSO: Air Compressors, Pneumatic Tools, Hydraulic Aviation Accessories, Diesel Engines, Rock Drills



Modernizing with New Drives

By FRANCIS A. WESTBROOK, M. E.

AS everybody knows, war production, demanding tremendous volume of war equipment without delay, has been acutely reflected in the machine tool situation. Builders of tools have been working night and day and their users have been doing everything possible to increase output. Rebuilt machinery dealers have been doing the biggest business on record. Isolated machine shops all over the country have had more business than they could handle with comfort.

Drafting existing machinery into

service has been one answer. Many ancient machine tools have been modernized and are giving excellent service on production lines, filling in during the emergency when later model tools were not available. One of the most profitable steps in modernizing the older tools is in connection with the drive equipment.

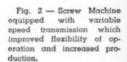
In a great many instances, it has been found that substitution of individual motor drives for large groups makes for more efficient operation and, in other cases, a rearrangement of group-



Fig. 1—Vertical Milling Machine equipped with an infinitely variable speed drive, which provides a wide range of speeds for different cutter sizes.

ings has given the required results. But in any case, there is probably nothing which does more to modernize a machine tool than the provision of adequate means of accurate and easy speed control. This is obvious enough when one considers that for different materials and cuts, there should be an optimum speed of operation. Modern carbide tooling demands higher operating speeds for maximum results. great many sturdy old machines are entirely capable of turning out satisfactory work and are only deficient in accuracy and modern speed control standards.

Reference to a few specific applications of mechanical variable speed control units to different types of machine tools will show rather convincingly how easy it is to make the applications and how beneficial the results can be. In the first place it should be pointed out that 3 general types of variable control units are available. These include the variable speed transmission which is a separate unit by itself and is installed between driving and driven elements. Then there is the variable speed pulley which is the driving pulley of the transmission, and, finally, the integral motorized variable speed trans-





Accordingly, many machine tool users have equipped their machines with mechanical variable speed transmission units. Where needed, these provide a flexibility of control which it is not possible to obtain with step cone pulleys, gear boxes, slip clutches or variable speed motors, because, with the stepless variable speed mechanical units, it is possible to obtain the exact speed required, if units providing the right ratios are installed. This, of course, is easy to determine with assistance of the equipment manufacturers.

mission, generally used as an individual drive. All accomplish the same purpose but are applicable under somewhat different conditions. That is, the variable speed transmission is available for power applications of from fractional to 82 hp requirements. It can be totally enclosed or open, may have electrical remote control or completely automatic control for the speed setting or may be manually controlled by the simple turning a small wheel. It is particlarly applicable where there is an existing individual motor and where

THE "INSIDE" STORY



HEVI DUTY CARBURIZER

The "Inside" Story of the Hevi Duty Carburiser is the story of its national use in mass production of carburised parts, and of its flexibility for use in Nitriding... Bright Annealing and Clean Hardening. The "Inside" story of its design, durable construction and efficient operation is told in the new Hevi Duty Carburiser Bulletin HD-142 — Send for your copy.

Typical "Inside" view of the Hevi Duty Carburizer

HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEMEDUTY ELECTRIC EXCLUSIVELY MILWAUKEE, WISCONSIN

the power to be transmitted is comparatively large.

The variable speed pulley is a very compact arrangement and can be had for power requirements varying from fractional to 15 hp. It is installed on the shaft, or shaft extension of constant speed motors and eliminates belts, chains, gears, etc. It is controlled as to speed setting by a convenient handwheel, or by remote push button control.

The motorized variable speed transmission is available in ratings up to 10 hp and, of course, makes a very compact and space-saving drive. It is particularly applicable to tools which are being individually motorized.

In a Pittsburgh plant, one of the largest producers of automobile axles and forgings, it was found necessary to step up production to meet the war emergency. The machine tools in the plant were driven from lineshafting and provided with cone pulleys. Production from them was not what it might be. This was corrected by equipping the tools with individual constant speed motors and variable speed transmissions.

A Becker vertical milling machine in another plant is shown in Fig. 1 which is used for a wide variety of work. That great variation in speed is needed is shown by the fact that for a 6" cutter, low spindle speeds are employed which are progressively increased as the size of the cutter decreases, until with a 1" cutter, a high spindle speed is demanded. Both larger and smaller cutters are used on different metals, such as steel, cast iron, aluminum, etc., all of which have their influence on the best speed to employ for a given job. In this instance, the necessary speed changes are provided by means of a vertical type variable speed transmission unit (shown with the guard removed) mounted on a framework at one end of the machine.

This transmission is driven from a 3 hp constant speed motor and the variable speed shaft drives the spindle on the milling machine thru a back gear mounted in a pulley at the top, as shown. When the machine is in open-belt, or high gear, spindle speeds of from 118 to 650 rpm are available, and any speed (in small increments) between these limits at the turn of the handwheel.



Fig. 3—Drill Press equipped with variable speed drive for increased versatility.

A screw machine with an enclosed design variable speed transmission is shown in Fig. 2. As will be seen, the transmission is mounted in a vertical position on a plate at rear of the machine immediately over the 2 hp motor. Spindle speeds of from 139 to 559 rpm are provided. Exceptionally convenient control of speed cuttings is obtained by a set of mitre gears on the speed shifting screw of the transmission, which brings the handwheel

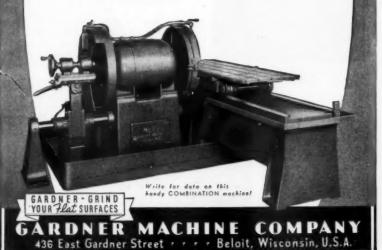
This combination doubles results

for many shops
with varied flat surface work

POR plants handling ordinary flat surface parts suited to a standard Disc Grinder, as well as large work coming under the classification of "surface grinding," this Gardner Combination Disc & Surface Grinder, is ideal.

The right-hand end carries a hand-operated sliding Surface Table, while the left is equipped with a standard lever-feed table. The machine carries 30" abrasive members, and is powered by a built-in 15 H.P. motor.

The surface table is well adapted to the edges of armor plate, or other large work of similar nature. It doubles the capacity of the ordinary Disc Grinder, and saves valuable floor space, as well.



directly in front of the operator's position.

An interesting application of motorized variable speed raised the efficiency of a lathe 36%. The speed control unit was installed out of the way under the machine on a small base plate, but the handwheel control was extended to within easy reach of operator. Any speed is provided over the range of 111 to 333 rpm.



A direct connection of one of the individually motorized units, also embodying a speed reducer, is shown on a vertical drill press in Fig. 3. The drill press was so equipped in order that it might be used for a considerable assortment of miscellaneous parts at the most efficient speeds.

Two variable speed motor pulleys were easily bolted to the main frame of the 4-spindle drill presses shown in Fig. 4. These 2 units were combined to form a single 8-spindle unit for continuous work in drilling, tapping, turning and facing bosses. The operator handles all the work at one job on a continuous bed plate moving from left to right. Each drill press is equipped with the variable speed motor pulley in order to provide a wide range of "in-between" speeds which it is impossible to get by changing pulleys on the presses alone.

On the bench lathe in Fig. 5, gear box and step pulley speed changes were found to be insufficient when boring cone-shaped discs in diameters of 36, 12, 36, 34 and 1". The easy solution was to mount a variable speed motor pulley on a plate which was easily bolted to the frame of the lathe as shown. With infinite speed adjustability over a 3:1 ratio of speed range,

Fig. 4—(above) Motorizing two 4-spindle Drill Presses to form a single 8-spindle unit. Fig. 5—(right) Variable speed drive for Bench Lathe providing a speed range for a wide variety of jobs.



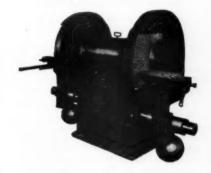
The RIGHT MACHINE for the Job



Besly can give you the proper machine for your disc grinding operation. From the No. 5-18" light Direct Connected Motor Driven Machine to the powerful No. 214-40" Vee Belt Drive Besly Grinder. Double Spindle Machines for grinding two surfaces simultaneously with grinding members 15" to 72" inclusive—Vertical Spindle Disc Grinders with wheels 18" to 72".



Write for your copy of Booklet on Besly Titan Steelbacs



A great variety of feeding arrangments are available and all machines can be furnished for either wet or dry grinding. If you have a flat surfacing problem put it up to Besly.

CHARLES H. BESLY AND COMPANY
118-124 NORTH CLINTON STREET & CHICAGO, ILLINOIS



Fig. 6.—Top bracket mounting for drive on a Horizontal Milling Machine.

and with the belt on the largest pulley on the headstock, spindle speeds of from 224 to 638 are instantly available. With back gear, the spindle may be slowed down to 41 to 117 rpm, which is sufficient range for the most exacting requirements.

High speed steel tools are used to drill cast iron jig castings in diameters ranging from % up to 3" in increments of %" on the horizontal milling machine shown in Fig. 6. The variable speed motor pulley mounted by means of a special bracket on top offers a wide speed variation; high speeds for small diameters and lower speeds for the larger jobs.

Many more examples could be cited from actual experience, but the foregoing will give a good idea of the possibilities in regard to speed control and the resulting advantages in these days of hectic demand for machine tool production. In times like these, when deliveries of new machine tools are slow, there is a distinct advantage in modernizing old tools as much as possible. Experience has shown that, in many instances, this can be done to a remarkably satisfactory extent, and that combinations can be devised for special purposes, as with the 2 or more drill presses just mentioned, which save much time and labor. The limits of what can be done along such lines seem to be largely determined by the ingenuity and resourcefulness of those responsible for production.

Lubrication Handbook

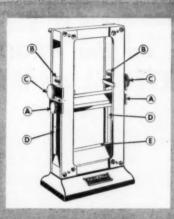
An interesting new 60-page bulletin has been issued by Cincinnati Milling and Grinding Machines, Inc., Cincinnati, Ohio. It is devoted entirely to lubricating specifications and instructions on the Company's complete line of milling, grinding, broaching and lapping machines. The different models are depicted in line drawings with names and reference numbers applying to the oiling instructions. Methods of oil application are given, together with frequency and quantities of oil required. Careful study and application of these detailed lubricating hints will assure better performance and longer useful life, since lubrication is becoming a more important consideration in connection with hydraulically actuated machines.

Abrasive Drill Packages

Abrasive drills used in the manufacture of important military equipment are shipped and stored satisfactorily when packaged in transparent strips fabricated of "Pyralin" cellulose nitrate plastic.

Strips of the tough, pliable plastic are cut to hold twelve drills of the same size, drills with large heads being reversed. The plastic assures a neat packing job, and affords necessary protection to valuable drills.

Packages are made for the Norton Company, Worcester, Mass., by Boutwell, Owens & Co., Leominster, Mass., from "Pyralin" produced by the Du Pont Company. Increase your efficiency in setting your Internal Indicators





Above is a photograph of the Ellstrom Gage with the indicator being set at 3". To insure the ultimate in accuracy, each Ellstrom Gage is constructed of the finest steel with gaging surfaces that are processed and finished to millionths in flatness. For prices and delivery information wire or write today.

THE diagram drawing above shows the Ellstrom Gage set at 3" and the key explanation below gives the adjusting procedure.

Screws A on upper parallel bar have been carefully adjusted and need not be touched. In raising or lowering the bar loosen only screws C, then place fingers on screws A, and move bar upward or downward as the case may be, but without turning the screws.

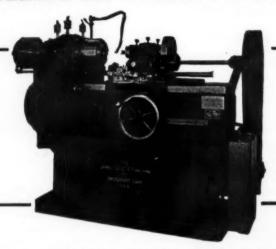
Allow room to place the gage blocks on lower parallel between the posts of the gage. Then lower bar until its surfaces and those of the blocks fit snugly without any forcing. Tighten screw C lightly and evenly. Screws B are then used to apply slight pressure in making final adjustment.

D gage blocks E stationary parallel

Originators of Chromium Plated Gage Blocks

DEARBORN GAGE COMPANY 22033 BEECH STREET

on the PRODUCTION of EXTERNAL and INTERNAL THREADS



The Coulter Type "H" Hob Thread Miller-modern in every detail of design and construction-handles high speed, accurate production of right or left hand threads. Any parts that can be held in ordinary chucks, air operated chucks, air operated chucks, air operated collet chuck or special face plate fixture can be threaded on this machine.

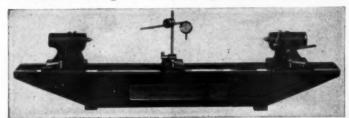
Work holding spindle and cutter spindle are driven by individual motors through worm and gears. Speed changes to work spindle are accomplished by pick-off gears; cutter spindle speeds are controlled by variable motor sheave. All high speed shafts turn in anti-friction bearings.

Maximum external thread, 7t; minimum hole depends on smallest hob practical.

Send for Descriptive Bulletin giving full information.

The James COULTER Machine Co. BRIDGEPORT . CONNECTICUT . U.S.A.

Here's a BENCH CENTER for You! Precise • Rigid • Compact • Portable



* Made by Sundstrand

Companion products of the famous Sundstrand Rigidmils and Stub Lather, Sundstrand Bench Centers are equally effective in promoting speed and precision in their simpler but essential duties. Accurate, rigid, compact, durable, economical, they are unexcelled for testing and checking work between centers—widely used in toolrooms, production departments, repair shops, garages.

Sundstrand Bench Centers are made in 7 sizes from 6"x18" to 12"x60", all portable, readily used on any suitable bench or stand convenient to the work. Features include quickly adjustable heads, hardened and ground centers, accurate taper fit in spindles. Spring-Loaded spindle of the right-hand head, with retractor lever, speeds work-handling. Investigate advantages and check your requirements, now.

DEALERS: Increase sales and help customers with Sundstrand Open Line Tools — Bench Centers, Manual Index Bases, Balancing Tools. Needed in many enlarged and "converted" shops, they offer outstanding quality, utility, value. Information on request.



Operator of highproduction lathe checks work-piece on Sundstrand Bench Center.

Write for Bulletin

Bulletin 404 gives description, sizes, weights of Sundstrand Bench Centers and Balancing Tools. Write for your copy, and name of nearest dealer, today.



Sundstrand Machine Tool Co.
2535 Eleventh Street, Rockford, Illinote, U. S. A.

RIGIDMILS • STUB LATHES

Drilling and Centering Machines • Hydraulic Operating Equipmen

"PUT IT ON THE BLANCHARD"



For speed, accuracy, and low cost on your larger surfaces you should investigate the Blanchard No. 27.

Grind Large Work

This Blanchard No. 27 Surface Grinder, with 42" segment wheel and 84" swing, grinds steel and semisteel die shoes from the rough. The work varies in size but each chuck load, whether one large piece or several small pieces, presents a large area from which ½" to ½" stock must be removed. Because of the competitive nature of the product (atandardized die sets) every effort must be made to keep costs low. Loading time is shortened by using a lifting magnet, and the grinding is done at the fastest possible rate. The machine is kept continuously busy and, in addition to die shoes, it machines many large steel plates.

The BLANCHARD MACHINE COMPANY 64 STATE STREET, CAMBRIDGE, MASS.



Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard waners.



Tipped Versus Solid Tools

By LEO J. ST. CLAIR*

N view of the current emphasis on conservation of strategic cutting tools, some of our experiences with tipped H. S. S. tools should be inter-Many of these tipped tools esting. have been prepared in accordance with a procedure developed by our Company and users are reporting substantial increases in tool life between grinds, as compared with the performance of solid H. S. S. tools previously In many cases, these tipped tools were used on work identically the same as that performed by the scrapped H. S. S. Tool formerly on the job, material from which was used to make up the new tipped tool. the solid H. S. S. tools became too short, the user sent the scrap ends to us. The ends were cut up into tips and brazed to tough alloy steel shanks.

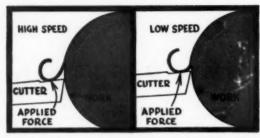
Many inquiries have been made by the users as to the reason why the same H. S. S. in a tipped tool gives a longer useful life on the same job than it did in the form of a solid tool. The explanation of this puzzling phenomenon leads into an analysis of how a cutting tool dulls.

I will have to exclude the instances of increased life due to use of harder tools in the form of tipped tools than as solid tools. A large proportion of the solid H. S. S. tool is used for clamping and holding, and also to support the cutting edge. Hence the hardness of the tool must necessarily

be held down to provide enough strength for the tool to do its work without breaking off. Tools with narrow cutting edges projecting from the main body often give trouble due to the weak or brittle support provided by the hardened H. S. S. Often several points in Rockwell hardness are sacrificed to the detriment of cutting edge life, to prevent tool breakage. Since the tipped H. S. S. tool uses a tough alloy steel for support and clamping, the H. S. S. tip can be made of the proper cutting hardness for the work involved without considering shank strength at all. An increase of two to four Rockwell "C" points is thereby obtained and surprising increases in tool life ensue. This is not the kind of increase in life that I want to analyze. I am considering the increased life resulting when the hardness of the tipped tool is the same as the former solid tool previously used

Frederick Taylor in 1902, came to the decision that the 2 main causes of tool dulling were: — (1) The initial dulling resulting from pure abrasion taking place at a slow rate; (2) The final dulling or breakdown resulting from excessive abrasion due to loss of clearance and the friction of the chip on the top face and the resultant "heat softening." This softening of the cutting edge area resulted in rapid de-

*President, General Tool & Die Corp., 555 Prospect St., East Orange, N. J.



Sketch (A) at the right shows applied force against top face of tool near cutting edge. Sketch (B) at left shows applied force of chip farther away from cutting edge.

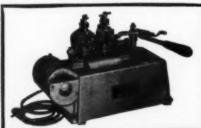
struction of the tool and, if allowed to go too far, the tool "burned."

I accepted this theory without question until the advent of carbide tools. Users soon learned that the successful use of carbide tools on steel cutting required high cutting speeds, and that low cutting speed was very detrimental to tool life. Here was a case, that in spite of the increased abrasion forces due to high cutting speeds did not "wear" the tool as fast as the lower abrasion forces at play when using low eutting speeds.

I could not decide why this took place by examining a tool after it had dulled, so I decided to carry on the examination of the gradual dulling of a tool by choosing a job where the cutting time was short and the tool life involved many pieces. I chose a job where a carbide tool running at 300 fpm. had a tool life of 400 pieces between grinds, while at 100 fpm. the carbide tool life permitted cutting only 50 pieces. (H. S. S. tools had a life of 100 pieces at 100 fpm.) At the low speed, the carbide tool gave only ½ the life of the H. S. S. tools, while at 3 times the speed, the carbide tool gave 4 times as long a useful life.

The carbide tool was examined carefully after each piece with a magnifying glass, at both the high and low cutting speeds. The first thing I observed was a minute chipping of the cutting edge in both cases. This minute chipping took place noticeably after the first 5 pieces at the low speed while the same chipped condition did not appear at the high speed until after about 100 pieces had been machined.

The evidence of this minute chipping was destroyed after cutting about 20 pieces at the low speed and after doing about 300 pieces at high speed. Wear on the tools at this point looked like pure abrasion and both tools appeared about the same. Surely any-

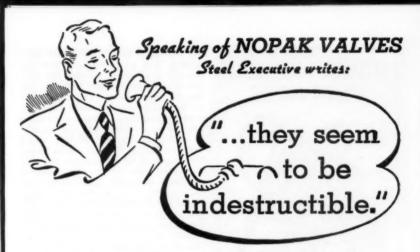


BAND SAW WELDERS

The No. 141 Bench Type Metal Working Band Saw Welder is available with or without grinder. Work can be annealed without removing from the Welder. Band saws up to %4 wide may be welded.

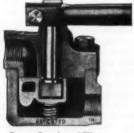
1 KVA-110 Volt-60 Cycle-single phase-5 point heat control-1 point anneal heat-Weight 40 lbs. Let us send you further details. Mfrs. of complete line of Spot, Butt. Seam, Flash, Projection and Special Welders.

WELDEX INC., 7225 M.DOHALD AVE., DETROIT, MICH.



• In May, 1927, twenty-two NOPAK Valves were installed on air pressure lines in the Worden-Allen Co. plant. On May 1, 1929, the plant superintendent reported: "All valves O.K., will not flicker a

match." On July 11, 1931: "... every valve tested and found in perfect shape. No repairs or adjustments of any sort...since original installation."



Cross-Sectional View, NOPAK 3- and 4-Way Valve. Simple design, rugged construction, packless assembly, and the famous NOPAK Bridged-Disc Principle make NOPAK Valves leakproof and wearproof. Perfectly lapped, leakproof sealing surfaces of disc and seat improve with use . . . are constantly shielded from grit abrasion.

After fifteen years, March 23, 1942, the company's president wrote regarding original installation and subsequent purchases:- "... all valves still in service, except where air pipes have been removed ... they seem to be indestructible."

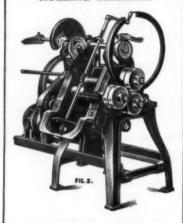
Production executives, NOPAK Valves, both shut-off and operating, will deliver the same long-lived, maintenance-free service in your plant. They are built for lifetime protection against air or pressure loss, ease and speed of operation, plus precision control of air or hydraulic power. For detailed information and data, write for Bulletin 84.

GALLAND-HENNING MFG. CO. 2754 South 31st Street, Milwaukee, Wisconsin

VALVES and CYLINDERS

DESIGNED for AIR or HYDRAULIC SERVICE

EXCELSIOR No. 14 ANGLE ROLLING MACHINE



Capacity 2x2x1/4* Angles. All the rolls are direct driven avoiding slipping of the material between rolls, which are operated by the oversize Excelsior friction clutch. Write for Price and Testimonials.

We specialize in Automatic Grinding and Polishing Machines, to polish Stainless Steel Sheets, Automobile Bumpers, and parts, Stove and Range Top Castings, Electric Iron Sole Plates, etc.

Also Inside Cutting Shears, Deep Throat Power Punches for duplicate work by the use of horse shoe templets up to No. 12 gauge. Used in Stove, Range, Air Conditioning and Kitchen Equipment Plants.

TOOL & MACHINE CO.

East St. Louis, Illinois

one observing these tools would have decided that pure abrasion was the answer. Evidence pointed out that minute chipping of the cutting edge was the true answer. From this point on to the removal of both tools, the wear increase appeared about the same but the slow speed tool did another 30 pieces as against the high speed tool accounting for 100 more pieces. The cause of the accelerated chipping of cutting edge at the low speed as compared with high speed was due to the applied force of the chip taking place nearer to the cutting edge at the low speed as compared with the high speed. As speed was increased, the applied force of the chip against the face of the tool was farther and farther away from the cutting edge, because of the greater "wedging" action taking place at the higher speed. two accompanying sketches indicate this. The closer the applied force was to the cutting edge, the quicker the edge of the tool "chipped" and this resulted in shorter tool life.

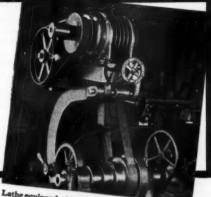
This experiment proved to me that dulling took place in 3 stages rather than 2 and the first stage was by far the most important. The first stage of dulling is generally evident in minute chipping or breaking of the cutting edge (not visible to the naked The second stage is abrasion, and the third stage, abrasion and heat softening. I checked this dulling phenomena on H. S. S. tools and found the same thing taking place. This pointed out clearly the reason for poor tool life if the H. S. S. tool was made too hard for the job. Then chipping took place rapidly as compared with a tool of the proper hardness.

I also observed another phenomenon strengthening my conviction that pure abrasion was not the most important reason for tool dulling. The life of a cutting tool can be expressed in linear feet of contact between the tool

ANY SPEED

-not just

AT THE TURN OF A_HANDWHEEL



Lathe equipped with REEVES Machine Tool Drive, utilizing the REEVES Vari-Speed Motor Pulley



9

New, Bracket-Mounted,
Motorized, Easily-Applied REEVES Machine
Tool Drive Provides
Range" Speed Adjustability

Infinite, accurate speed adjustability is now available for more
machine tools. The new REEVES
Machine Tool Drive enables the
operator to secure exactly the
best speed for any size, type
and diameter of material in work
—at turn of a handwheel, while
machine is running. Widens work
range. Releases full capacities of
range and machines. Send for full
details in Bulletin MT-421.

UTILIZES EITHER OF THESE REEVES UNITS



VARI-SPEED MOTOR PULLEY with countershaft. Handwheel control moves motor on sliding base to vary speeds. Fractional to 7½ h.p. within 3:1 speed ratios.



MOTODRIVE—combines constant speed motor, variable speed drive and gear reducer, if needed, in one compact unit. To 10 h.p.; speedratios 2:1 through 6:1.

REEVES PULLEY COMPANY, Columbus, Indiana

REEVES

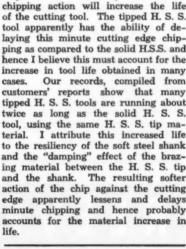
 Compact assembly of constant speed motor, variable speed unit and mounting bracket for attacking to most machine tools by four cap screws.

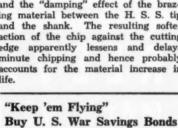
MACHINE TOOL DRIVE

and the work. A good tool life on roughing steel shafting with carbide tools varies from 30,000 to 50,000 linear feet on contact. This amounts to from 2 to 3 hours of constant cutting with a .020" feed and a speed of 300 fpm. In drawing steel wire thru a carbide die, it is not uncommon to draw 500 .-000 feet of wire before a die goes off size by .002". The amount of wear

resulting in a die from this long contact thru the die is far less than the amount of wear allowed on a cutting tool before it is considered dull. When drawing wire, compression forces are at play that are of greater magnitude than the shear forces resulting when a tool is cutting metal. In spite of the greater abrasion forces at play, the drawing die is in contact with the wire at least 10 times longer than in the case of the cutting tool being in contact with its work, proving that if abrasion were the most important reason for the dulling of a tool, the wire die would wear out within a lesser number of contact feet than the cutting tools.

If one realizes, that initial minute chipping of the cutting edge is the most important reason why a tool dulls, it is clear that any method which may be used to delay this minute chipping action will increase the life of the cutting tool. The tipped H. S. S. tool apparently has the ability of delaying this minute cutting edge chipping as compared to the solid H.S.S. and hence I believe this must account for the increase in tool life obtained in many Our records, compiled from customers' reports show that many tipped H. S. S. tools are running about twice as long as the solid H. S. S. tool, using the same H. S. S. tip material. I attribute this increased life to the resiliency of the soft steel shank and the "damping" effect of the brazing material between the H. S. S. tip and the shank. The resulting softer action of the chip against the cutting edge apparently lessens and delays minute chipping and hence probably accounts for the material increase in life.





and Stamps

TURRET TOOL POST

Hardened throughout, self-compensating for wear, precision built. For top production on small South Bend. Sheldon, Clausing, Atlas, Logan and similar bench lathes and small screw machines.



F & M SALES COMPANY, HOLLYWOOD, CALIF. Manufacturers and Selling Agents



PLAIN, PRODUCTION & UNIVERSAL TYPES

GENERAL ENGINEERING & MFG. COMPANY MISSOURI ST. LOUIS

FOR SALE

(Delivery 4 Weeks*)

DESIGNED FOR * * *

- External, internal, face, angle, or straight finish grinding AND rough turning!
- * Face Jobs—up to 30" diameter.
- * Internal Jobs—straight or taper up to 30" diameter.
- * External Jobs—up to 27" diameter.

Precision Work . . .

Hand-scraped, dove-tailed ways with adjustable tapered gibs for cross-slide and carriage. Quickchange 80 or 130 RPM work speeds and variable quill speeds.

* At Time This Ad Was Written



PRIORITY_

Priorities can be had. Write for details. No obligation.

\$1200

F. O. B. CLEVELAND



AUTOMATIC SIZING DEVICE..

Foolproofs production runs! Duplicates size on successive pieces precisely! Saveslots of time, too!

ten SEE ONE WORK-MAIL COUPON

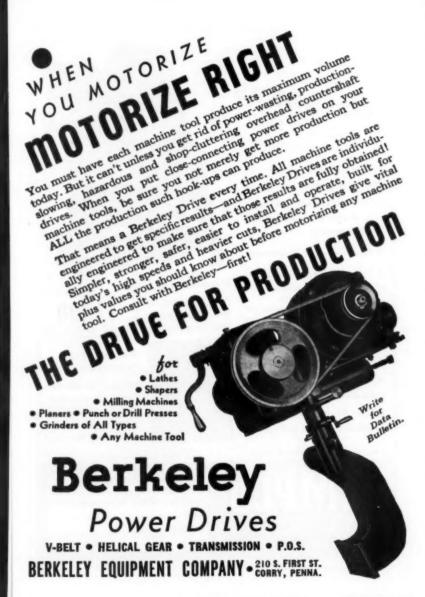
LEMPCO

PRODUCTS INC. BEDFORD - ONIO - U-S-A

Lempco,	Dept. M. B	edford, O	oio
GENTLEME	N: Tell me p	lant near	est me where
I may se	e a LEMPCO	Grinder i	n operation.

ADDRESS.....

CITY..... STATE.....



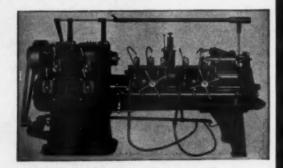




Send us your specifications and blueprints—We will see that your job is set up with the right LIVE CENTER—prompt deliveries on high priorities.

TOOL COMPANY 5224 THIRD AVE. DETROIT, MICH.

A RUGGED. SEMI-AUTOMATIC OF PROVEN DESIGN. ROVIDING A RAPID AETHOD OF TURNING ITHER LARGE OR MALL LOT PRODUCTION



he Lo-swing Lathe principle differs sically from the conventional lathe in at multiple tools cut simultaneously. Lo-swing design, the cutting points of e tools are always close to the carriage ays - eliminating all possibility of their oringing away from the work. The Loving Steady Rest, likewise, prevents the ork from springing away from the tools.

y the Lo-swing method, the total turng time is only the actual time required make the longest individual cut. As any tools can be used as the job requires, I cuts being accomplished at one passage the carriage, the travel of which is nally but a fraction of the length of e work itself.

Lo-swing Lathes are made in two standard sizes: 4-inch and 8-inch. Their design makes them particularly suited for the rapid turning of shafts up to 8 inch diameter by 132 inch length, in the standard models. Routine operations include turning several diameters, both straight and taper, squaring shoulders, necking for grinding and making form cuts. Power operated tools on a rear carriage are provided when necessary.

Adequate equipment for all ordinary work is available in standard accessories. For large lot production special tooling can be furnished to further increase production economies. Regardless of how complicated the tooling, the Lo-swing is quickly set-up for different jobs,

SENECA FALLS Automatic WORK DRIVER



Self Centering ... Quick Acting ... No Slip. Attaches to any chuck plate or spindle. Provides a positive, balanced drive which reduces chatter. Handles rough forgings or turned pieces-straight or taper. Eliminates dogging time. Reduces tool breakage. Write for details and size range.

ENECA FALLS MACHINE CO.

"Overmotoring" Hampers War Effort

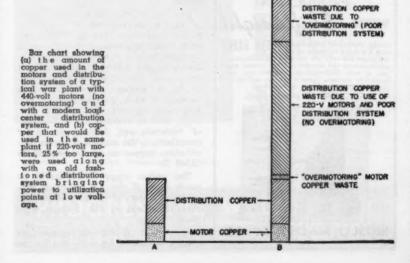
By L. A. UMANSKY*

BECAUSE of "overmotoring," up to 25% more material and labor are now going into production of motors than is needed for work the motors are being called upon to do. Motor users and specifiers can help greatly in conserving critical materials and in helping motor manufacturers produce the maximum number of motors to win the war, by selecting the motor size on the basis of the actual expected duty without overstress on additional safety factors to take care of unex-

pectedly heavy loads or to lengthen motor life When in doubt, consider the next smaller rating.

Conservatism in motor selection, however commendable in normal times, must be discarded for the duration. Altho modern motors are considerably lighter for the same horsepower than those of a few years ago, because of better available materials, they are just as conservatively rated by the manu-

*Asst. Mgr., Industrial Dept., General Electric Co.



GRAHAM MULTI-PURPOSE VISE



This vise with attachments, saves making many a jig and fixture for work on drill press, radial, shaper, miller, planer, grinder. Also available plain (drilled and tapped to add attachments any time).

KNURL HOLDER FITTING LATHE TURRET



With one pair of straight-out knurls, this holder makes a variety of straight, spiral and checkered patterns. Shank to fit your turnet.

Request Illustrated Price Circulars

GRAHAM MFG. CO.

AVOID INJURY — SPEED PRODUCTION WITH Shiftweight

Hasky, wedded steel construction with a capacity to handle up to 300 peand wire colls with coll arms adjustable from a minimum inner coil diameter of 10° to extreme diameter of reel. Shiftweight is anartproof and easily handled by one man. Operates smoothly and will give years of trouble-free excise.

Write for folder giving complete details.



MOSLO MACHINERY CO.

facturer who has already designed into the motor a margin of safety to meet reasonable overloads.

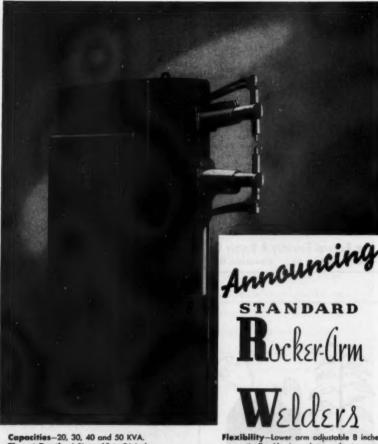
Overmotoring also affects almost everything else in a plant's electric chain including control, distribution, and generation, since capacity of the power system is very often based on the installed horsepower of motors. For this reason, in the distribution system lies our greatest opportunity to save copper thru careful motor selection and, of course, thru good system design.

In any electrical installation, only a small portion of the copper used is contained in motor windings. The bulk is in the distribution system—in the cables, buses, etc. Let us take, for instance, an average industrial plant, typical of many now being built for war production. Let's assume that 13, 200-volt power is brought to this plant and then stepped down to motor voltage, and that the total installed motor capacity is 10,000 hp, mostly in squirrel-cage motors. The plant is designed for 4000 kva capacity, or 40 per cent load factor.

Now, an average 7½ to 10-hp squirrel-cage motor requires not more than 2 to 3 lb of copper per hp. Under the most ideal conditions—440-volt motors powered from a materials-saving loadcenter system where power is stepped down near the utilization area—up to 5 lb of copper will probably be needed for each installed hp. If motors are selected 15 to 25% too large, then in addition to needless use of materials and facilities in motor manufacture, the amount of excess distribution copper is apt to be 7500 to 12.500 lb.

The excess copper used would be much more if the old-fashioned distribution system of carrying the power thru the plant at low voltage were used.

Worse yet, if 220-volt motors are chosen instead of 440-volt—this has no



Throat Depth-4 Sizes-12 to 36 inches. Operation-Foot, Air or Motor Driven. Construction-Completely Streamlined. Heavy duty. Easy to service.

Flexibility-Lower arm adjustable 8 inches vertically. Also in-and-out and rotary arm adjustment for electrode alignment and use of angle electrodes.

Ask for Bulletin No. 701 H

.. Electric Welding Equipment ... PORTABLE GUN & PEDESTAL

3050 E. OUTER DRIVE

DETROIT USA.

* THE * WONDER CUTTER

The lowestpriced wire and rod cutter on the market. The hardened cutters last indefinitely.

Hand operated. A giant for work, cuts wire and rods up to %-in. round or %-in. square and band iron up to % in. by 2-in. Adjustable stop for repeated cuts to same length. Large or small, your shop can use a WONDER CUTTER.

Write today for prices and trial offer.

The Federal Foundry & Supply Co. 4602 East 71st St., Cleveland, Ohio



effect on the amount of copper used in the motors—the distribution copper will go up to 10 lb per hp with the load-center distribution system and up to 18 to 20 lb with the old-fashioned system. The reason for this, of course, is that much more copper is needed to carsy the lower-voltage power to the motor.

A further evil of overmotoring that cannot be overlooked or disregarded is its effect on low power factor—another avoidable waste. Many splendid plants are probably operating at 40% power factor today, primarily because of heavy overmotoring.

All concerned can be of great help to the war effort by adherence to these principles:

- Select motors closer to their actual duty—avoid piling up "safety margins."
- If in doubt, do not arbitrarily select the next larger rating; perhaps the next smaller rating will do the job satisfactorily.
- 3. Utilize, wherever possible, the available service factor. For instance, the motor will not be injured if the service factor of 1.15 is used in some cases on the 40 C motors, altho continuous operation at the resulting 50 C rise may mean that the insulation will last only 10 years rather than 20. Even more loading, up to 125% can be utilized when ambient temperatures less than 40 C are expected.

(Of course, always check other factors such as starting or maximum torque, etc. Sometimes these, rather than the continuous rating, determine the motor size.)

- Don't use integral hp motors for voltages less than 440, unless unavoidable.
- 5. Bring high-voltage power to the load center.



WHETHER IT'S PRODUCTION TO MEET...

WAR DEMANDS

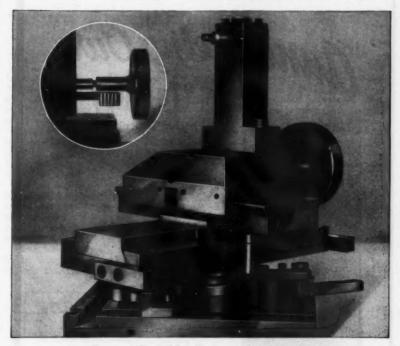


They're faster, far more economical, no wastage of air, easier to operate, no leakage from an ounce of pressure up to well over 14,000 pounds, longer life, trouble free operation. Slight push of plug into

socket it is connected absolutely air tight, air is automatically turned on. There is no turning of air valve, connection or hose. Easy pull back on sleeve and plug is ejected, disconnected and air is automatically turned off. Is it any wonder they're the talk of the trade and the choice of most of the big industrial plants thruout the country. SEND FOR FREE CATALOG.

Hansen MFG.CO. INDUSTRIAL Air Line EQUIPMENT

End "Check and Redress" . . .



with the New KOPEC!

Here at last is an angle tangent to radius dresser that can be adjusted quickly to gage block accuracy to secure innumerable contours.

Built-in sine bar eliminates visual errors. Rely on your gage blocks or micrometers for direct precision forms. Secure form results within a "tenth" on the first grind. Identical repeats all the time. For fast, efficient, economical dressing of radii, angles, and angles tangent to radii on abrasive wheels—don't say an "angle tangent to radius dresser." Specify the KOPEC.

Write, wire or telephone

Pictured above, the KOPEC with dustshields unattached. In circle, key slidingbar provides positive control of tangent travel.

S. J. KOPEC ENGINEERING COMPANY

17113 WEST McNICHOLS ROAD

DETROIT, U.S.A.

Amouncing Our "Toolboy"



A Portable Toolcrib for Holding and Shipping Midget Milling Cutters Combining these Unique Features.

- * 3 Convenient Sizes
- * No Loss in Transit
- * Prevents Dulling
- * Easy to Handle
- * No Unwrapping
- * Easy Inventory
- * Capacity of Each
- * Lid is Receptacle for Dull Cutters
- * Strong Construction
- * Use Little Storage Space
- * No Cut Fingers
- * Full Credit Allowed When Returned.

(Customer invoiced \$.75, \$1.00, or \$1.50 according to size.)

SEVERANCE TOOL COMPANY

SAGINAW, MICHIGAN

PRANCHE

Long Island City, N. Y. Los Angeles, Calif.
Betreit, Mich.

"Burn Another Inch— Build Another Ship"

So vital is are welding to America's tremendous shipbuilding program that failure to use the last available 4" of welding electrode stub may mean a loss of 25 ships a month.

Altho every 14" electrode can be burned down to a 2" or smaller stub, workmen sometimes throw away 3-1/3", and some even discard as much as 6".

The use of merely another 1-1/3" on the average stub would be sufficient to add another 5-½ boats to the nearly 60 cargo vessels of arc welded construction the U. S. is now turning out each month.

These estimates were made by A. F. Davis, Vice President, The Lincoln Electric Co., Cleveland. "Construction of one arc welded cargo boat now requires the use of approximately 175,000 pounds of electrodes," Davis explained. "If you multiply that by 60, an approximation of the number of vessels of arc welded construction coming off the ways each month, you arrive at a huge figure of 10,500,000 pounds. In other words, every inch of welding electrode is vital to the shipbuilding program.

"Each original electrode is 14" long, and if the average welder uses only 10-2/3" the remaining 3-1/3" is thrown away as unusable.

"But we have found that he can very well use another 1-1/3"—enough to do all the welded construction on 5-½ vessels.

WELDED SHIP PRODUCTION LOST PER MONTH in U.S. SHIPYARDS by discarding excessive Electrode Stub Ends

MATERIAL AND LABO	A LOST PER MONTH
If Stub End loss is	31/3 inche
While Stub End loss should be	2 inche
Useful electrode loss is	1 1 % inche
Useful Electrode fest as per cent of total length used	9½%

nationals U.S. Cargo Stripper 1.

10,500,000/bs.

BURN ANOTHER INCH *

SHII	PS LOST PER MONTH
Length of St	ubs Number of Ships
2 inches	0
3%inches	51/4
4 inches	8%
5 inches	13
6inches	25

Usable Electrode 1,000,000 lbs

BUILD ANOTHER SHIP

Courtesy of The Lincoln Electric Co. Climatum Chia.



"By the same estimates, if he discards a 6" stub, he is throwing away enough electrode material to weld 25 vessels.

"Therefore, it cannot be over-emphasized that every workman should use 12" of every 14" electrode that comes into his hands.

"An easy slogan for him to remember would be 'Burn Another Inch and

Build Another Ship.'

"Control of stub-end losses, which are part of the cost of electrodes, is also an effective means of cost reduc-

tion, easily accomplished.

"The cost per pound of the weld metal that is deposited goes up sharply in proportion to the length of the stub end that is discarded. Thus, if 14" electrodes are burned to 2" stubs, the cost of the deposited metal is \$0.967 a pound; but if 14" electrodes are burned to 4" stubs, the cost of the deposited metal goes up \$1.03. When 6" stubs are left, the cost is \$1.089 and when 8" stubs remain, the cost is \$1.206 per pound.

"Labor cost per pound of electrode deposited increases with increased stub-end losses, because of a greater number of interruptions for changing electrodes and a lower operating factor. On the average, labor cost increases 3 per cent for each 2" above the

standard 2" stub end loss.

"Burning down the 14" electrodes to stubs 6" long, the workman must make 12 electrode changes per pound of electrode material. If he burns them to 5", he has to make 11 changes; to 4", 10 changes; to 3-1/3", 9 changes; and to 2", 8 changes. Recent surveys indicate that one change requires an average of 21.6 seconds when the welder does his own cleaning of deposited bead."

"Keep 'em Flying"
Buy U. S. War Savings
Bonds and Stamps

another Tribute To The

Super Smooth Finish and Accuracy of SUNNEN PRECISION HONING

● To aid them in living up to their slogan of "It Must Be Right," the Hydraulic Press Manufacturing Company has adopted Sunnen Precision Honing.

Replacing hand reaming, the Sunnen method not only saves time, but, in addition, makes possible close tolerances and a super-smooth finish.

You, Too, Can Profit by These Advantages —

If you are reaming or grinding internal cylindrical surfaces from .185° to 2.400° in diameter, this practical, inexpensive, accurate machine will help you speed up production, cut costs, and improve accuracy.

The Sunnen Precision Honing Machine does not require skilled labor—workers in "teens" can handle jobs in "tenths." Can be set up and work located in less than a minute. Accuracy within .0001" guaranteed. Corrects errors of out-of-roundness or taper caused by previous operations. Relieves big internal grinders for other jobs. Doesn't need fixtures—work is held in hand by operator. Provides simple, low-cost method for duplicating sizes.

Put Sunnen Precision Honing to work in your plant.

SUNNEN PRODUCTS COMPANY

SUMMEN

Send for FREE BULLETIN

—giving complete information. Or, if you prefer, a Sunnen Sales Engineer will demonstrate this equipment in your plant on your job.

To insure interchangeability of parts, we use Sunnen honing on our HYDRO-POWER Valves and Control Bodies.

- The Hydraulic Press Manufacturing Co.





Arlution Hydrastic Cylinder mode of Atomicum-Alicy, Improves the quality of the bearing serious. An entremaly emoth serious-



Alcoraft Valve Toppet



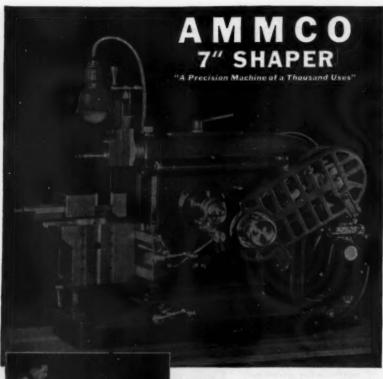
Alspiane Engine Ports accordisly hased to a super-amount finish.



from Volve. The Sunne method of hooing



Stead Engine Fuel Injector Cylinder "So occur cuts that a piston can be for within 20005 in:



IT'S PORTABLE

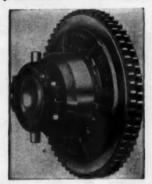
-- Saves Steps and Time --

Don't tie up a big shaper when so many jobs can be done just as accurately and much quicker and more economically on the AMMCO 7" PRECISION SHAPER.

Available for stationary installation or mounted on portable cabinet easily rolled to the mechanic's workbench...Write today for specifications and prices.

AUTOMOTIVE MAINTENANCE MACHINERY CO. 2106 Commonwealth Avenue North Chicago, Ill.

(Patented in U. S. A. and Canada)



CALLING the roll of the Conway Line covers every type from A to Z... they're all "present and accounted for."

And if there's a special purpose you have in mind, just state the problem and we'll come up with the right answer. Conway Clutches can be had "ready made" or "tailored to order."

A TYPE

FOR EVERY

PURPOSE

CONWAY

Whatever you need . . . you'll be getting these great features:

full floating plates high ratio leverage easy engagement easy instant release drag-free idling

Write for the complete Conway Catalogs

Standard Models

of catalog dimensions available for prompt delivery. THE

CONWAY CLUTCH COMPANY

1541 QUEEN CITY AVE.

CINCINNATI, OHIO

Tomkins-Johnson Air Powered RIVITOR

Furnishes "air squeeze" action combined with automatic feed riveting for aircraft production.

By using a different type of rivet set and jaw construction, Countersunk Head Rivets are handled as well as Flat Head, Round Head, Full and Semi-Brazier Head Rivets. For specifications, etc, write Dept. H.



EQUIPMENT HELPS ATTAIN MAXIMUM SPEED IN PRODUCTION

T-J Air Cylinders

These units exert power movement from 100 lbs. to 12,000 lbs. (direct). Made in styles, sizes and strokes to meet your requirements.

T-J Hydraulic Cylinders

Designed and furnished in types and sizes to exert power provement from 1,000 lbs. to 50,000 lbs. (direct).

For Catalogs on these cylinders write Dept. H.

THE TOMKINS-JOHNSON CO.

Jackson . . . Michigan

Hydraulic Cylinders

Cowl Ventilator Production

THE problem of turning out more than 20,000 large cowl ventilators faster than yards on the 3 coasts build 10,000-ton Liberty ships in which to transport cargoes of weapons and stores to America's far-flung battlefronts, has been solved by the Weber Showcase & Fixture Co., Inc.

Their answer to the demands for greater production was what is described as the largest drawing (die stamping) press in the world. This mammoth machine, weighing 250 tons and capable of squeezing large sheets of metal into difficult and complicated shapes without so much as tearing a corner, simplifies and accelerates production of ventilators. Two punches and dies, of hand ground cast Meehanite iron, necessary to form both halves of the ventilators, weigh 13 tons,

Unlike former presses of this kind,

the new structure, which started operation in early July, embodies Hcolumn construction, structural steel taking the place of forgings formerly employed as the 4 corner posts. The press also includes other features not found in older units.

To permit the deep drawing required for ventilators and other units which may be brought to the press in the future, the designers have allowed for 120" of daylight. This adequate space permits workmen to bolt a die of any anticipated size to a movable platen at the top, with the corresponding punch bolted to the lower platen. In operation, the rams which bring the 21½ ton top platen down have a stroke of 84". At end of the stroke, the platen presses against a bed measuring 8x12-ft, for a total bed area of 96 square ft. The combination of die space, air cush-

To turn out the large ventilators which a remade in halves and subsequently welded, 2 punches and dies of hand-ground cast Meehanite iron are employed. These units weight 13-tons.



ion arrangement, stroke and power make this a noteworthy machine. Sheet steel may be drawn to a maximum depth of 42".

Operating under pressure of 2,000 pounds, 3 large hydraulic pistons force the top platen down with a force of 1100 tons. The center cylinder, constructed of cast steel with 3½" walls, has an inside diameter of 26", and the outer rolled-steel cylinders measure 22".

Three hydraulic pumps are employed to move the top platen, 2 for the downstroke, one for the pullback. All pumps run when the press operates. By means of a bank of push-buttons, the downstroke speed may be varied at will thru 4 stages. Normally, the stroke starts down at the rate of 5 ft a minute, diminishing to 3 ft then 2 ft, and finally 2" inches a minute at end of the thrust. Pullback carries the die up 10 ft a minute.

As a rule, air cushion pads supporting lower platen of such a press are controlled by one main regulator valve. Here, however, the male die rests on a heavy steel bed, and the drawing rings are supported by 8 air cushions. each of which may be separately regulated at pressures ranging from 0 to 150 pounds. By this means, it becomes unnecessary, when drawing in the throat, to shim between the drawing rings, a procedure ordinarily practiced. In short, by changing pressures at various points around perimeter of the bed, stresses and strains may be so governed that the sheet being drawn will not crack and tear.

The base alone weighs 25 tons, and the top 9 tons. Three hundred and ninety tons of concrete support the press, this great quantity being poured both to withstand the great force exerted and to damp the vibration. Fact is, little impact is felt at the site itself, due to the squeezing action employed. Six-foot concrete walls surround the

pit in which the press rests, helping make the structure earthquake-proof.

Added strength is obtained thru use of rolled and welded cylinders and pistons. These parts are estimated to be 3 to 5 times stronger than castings. Only exception is the top center cylinder, which was available when the job started.



Said to be the largest drawing press in the world, this glant machine is now turning out 20,000 large cowl ventilators for the fleets of Liberty ships.

Use of the new press has reduced to 10 the number of operations required to turn out a ventilator. Of these, five involve welding. These are the steps:

- Pressing the sheet (14 gauge cold rolled deep drawing steel).
- (2) Trimming the flanges. For this purpose, company engineers developed a new method of cutting. A jig was built which rolls on a steel table. Half of a funnel is applied to the jig, pushed onto the table, and turned against a 6½" high carbon steel



FOR 10" 12" 14" WHEELS

Hammond NO-DUST GRINDER UNITS. Hammond Notices until the streamlined and functionally designed, require only 6½ eq. ft. of space for 12" and 14" models—less for 10". Average grinder with independent dust collector requires almost 15 eq. ft. of today's valuable floor space. Available for 16", 12" or 14" grinding wheels it is the most compact unit on the market. It is the practical approach to present needs for

conserving space.

The dust collector unit is mounted inaide the grinder. The only parts extend-ing are: fan motor, connecting pipes from the wheel guards to dust collector in the base, and air exhaust veni-guard.

COMPLETELY SELF-CONTAINED GRINDER WITH DUST COLLECTOR IN-THE-BASE

Write for Bulletin GP-13





EASTERN BRANCH 71 WEST 23RD STREET NEW YORK CITY

friction saw revolving 9,000 rpm. The saw, mounted on a vertical shaft, leaves no grits. The horizontal cut makes a clean trim, the operation requiring 60 to 90 seconds after the ventilator half reaches the jig.



Riveting and hammering, necessary in former "Losterback" construction, is no longer required. Now the halves are welded together and the structure is complete except for trimming, application of strength members, sand blasting and galvanizing.

(3) Welding the halves together. Because, as already explained, it is possible to regulate pressure at several points around lower platen where cracking or ripping may occur, riveting and hammering no longer are necessary. When air pressure is applied properly, a smoothly flowing metal draw results.

(4) Trimming bottom and face openings. This is accomplished by returning ventilators to trimming jig and making 2 passes against the friction saw.

(5) Roll and weld the collars.

- (6) Weld collars to vent.
- (7) Weld metal band to sleeve.
- (8) Weld round frame on edge of oval.
- (9) Sand-blast and galvanize.
- (10) Install screens, required to collect debris and break force of water when the vessel moves thru heavy seas.

Calls for ship cowl ventilators began rolling up like a snowball shortly after Dec. 7. Starting with Pacific coast shipyards, the demand spread rapidly until yards on the Gulf coast and along the Atlantic were seeking early delivery of large numbers. "Production schedules," commented Karl Weber, President of the company, "were speeded up to the maximum on cargo ships, which meant that fast production of cowl ventilators was essential. Whereas ventilators then were being made by the 'Lobsterback' method, of many



To speed production, a new method was developed for trimming the flanges. Each funnel is turned against a 6½" high carbon steel friction saw revolving at 9000 rpm. Operation requires 60 to 90 seconds.



"Carbide tool tips are important right now, and we were wasting plenty because of brazing strains—until we tried these clamp type tools. Now we just mill out a shank and attach a simple clamp as in the picture. We make our own clamps of SAE 1045 steel, and we don't use the clamps as chip breakers because they'd wear out too fast. Instead, we grind a shelf type chip breaker into the KENNAMETAL tip.

There are no brazing strains because there's no brazing! Grinding is easier, too, because only KENNAMETAL contacts the grinding wheel—there's no steel to load up and dull the grit. As the tip is reground, we move it forward and out under the clamp and place shims behind it. Saves shank steel too. One shank lasts long enough for three to five tips, and that's important these days.

We're getting even more work from the large KENNAMETAL tips now. I guess that's conserving a vital material . . . and what's more it's stepping down our costs. Sure glad we tried it!"

STANDARD KENNA-METAL TOOLS



STYLE 11



STYLE 15



MCKENNA METALS Co.

135 LLOYD AVE., LATROBE, PENNA.

Foreign Sales U.S. STEEL EXPORT CO., 30 Church St., New York

pieces welded and riveted together, die-stamping seemed the logical solution. Never before in the history of shipbuilding had die-stamped ventilators been manufactured. Manufactures and even the shiprights themselves were doubtful this method could be employed successfully."

This was no job for timid engineers and production men. The U. S. Maritime Commission needed ventilators in 8 shapes, measuring from 4'4\frac{1}{2}", to 8'6\frac{1}{2}" in height and 20 to 72" in diameter. Plans were substituted to Weber, and in a short time the company submitted its proposals, which were accepted.

Not yet was it known exactly how the ventilators would be manufactured on the schedule demanded, however. For a time, smaller ventilators were pressed, welded, riveted and hammered into shape, a combination of steps requiring too many man hours, and resulting in a product whose service life, it was thought, could be materially increased by eliminating rivets, which corrode and weaken the structure.

To make the larger ventilators, an effort was made to punch the halves in 2 pieces, using available presses, and weld the parts together. This procedure proved unsatisfactory. Shortly, in an effort to find a solution, W. A. (Bill) Pruett, research engineer for Weber, proposed that a larger press be obtained, one of sufficient capacity that the whole job could be undertaken in a single piece. Pruett canvassed major manufacturers. None could promise delivery within 10 months. Unwilling . . . and unable . . . to wait. Pruett searched Los Angeles for an engineer with facilities for designing, machining and assembling the various sub-assemblies, and set to work.

Shortly, having arrived at a design, the job was awarded the Hydraulic Press & Engineering Co., a concern headed by Jack Gantz, who is an experienced engineer on hydraulic mechanism. Plans perfected by these engineers, together with other consultants, called for H-column construction and use of structural steel. "We could not get forgings for 4 posts," explains Pruett, "so we took the next best course." During the first week, Pruett bought 190 tons of steel, rounding it up anywhere he could find it. He moved his office from the Weber factory into Gantz' shop, and began a campaign, by telephone and personal calls, for help.

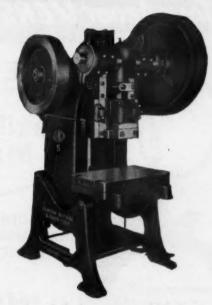
Gantz started rolling, welding and fabricating cylinders. Emsco Derrick & Equipment Co. fabricated the base, turned the pistons and welded the top member. The L & F Machine Co. fabricated and welded the movable platen and did considerable lathe and planer work. The Los Angeles Shipbuilding & Drydock Corp. undertook the planer work on the movable platen and the base, bored and ground the pull-back cylinders. Western Pipe & Steel Co. rolled the large cylinders from heavy sheet.

Pruett hounded the cooperating firms, parceling out small jobs to small machine shops. Meanwhile, he had other engineers figure stress analyses "on every bolt and nut in the job." He was taking no chances, for this was an important machine he was building. Should it break down, Liberty ships from Seattle to Maine might be delayed in going to sea. As a result of his day-and-night endeavor, 10 weeks after the plans were completed the huge press turned out its first large ventilator half.

Altho fabrication of ships' ventilators represents an unusual departure for a firm which, during its 44 years of manufacturing experience, has been turning out showcases, refrigerator equipment and similar goods, President Karl Weber declares he's ready to tackle any job his engineers think they can deliver.

BIG PRODUCTION INCREASES With Modern





Patented Non-Tripping
Mechanism

Much Larger Die Space Than Average Presses.

Engineered and Designed for Unlimited Peak Production.

Reinforced Construction at Points of Greatest Wear.

If you want the best, send for Illustrated catalog describing complete line TODAY.

REASONABLE DELIVERY ASSURED

* * * *

JOHNSON MACHINE AND PRESS CORP.,

ELKART, INDIANA

42 years engineering experience built into every Johnson Press used by leading manufacturers throughout the world!

TALK ABOUT VERSATILITY!



ONE STOW Flexible Shaft Machine

DOES

GRINDING SANDING
WIREBRUSHING DRILLING
BUFFING POLISHING
FILING

NEW STOW Flexible DRILL SHAFT for CLOSE-QUARTER OPERATION

Attach this shaft to your electric drill and you've got an amazingly versatile, useful tool—one that can be used with one hand. Fitted with either a 900 or 450 Park angle head, it can reach into the most awkward corners—perform the closest possible drilling. Ideal for aircraft production and other "tight-spot" work.

. . . and does it BETTER!

The great number of jobs that the Stow Flexible Shaft Machine can do has boosted its popularity by leaps and bounds. Butit's act only versatility that you get with STOW. There's also rugged dependability in every Stow machine—that extra strength and heavy-duty power that keeps steadily at it day after day of hard, continuous production. And now, when every minute counts, you can save literally hours a day by taking these easily-moved machines right to the jeb, anywhere in your plant, and making quick, convenient applications for particular work.

Backed by 67 years' experience as the originators of the flexible shaft, today 5tow offers the biggest selection of units and attachments on the market. Iron out many tough machining and finishing operations with the Stow Flexible Shaft Machine—it's a hundred tools in one! Send for our new catalog outlining the many valuable uses of Stow Machines in production lines, tool-rooms and maintenance work ... and if you've got a special problem let our engineers help solve it. Write us today!

MANUFACTURING CO., INC.
30 Shear St., Binghamton, N. Y.

LATHE CHUCKS

3-JAW UNIVERSAL GEARED SCROLL

\$45.00 61/4" SIZE AVAILABLE

FROM STOCK

HUCK CO.

ERSAL CHUCK

Combining strength with accuracy making it readily adaptable for either light or heavy duty work.

* Body-semi steel casting, ruggedly designed for maximum strength

* Jaws-Steel, hardened and ground, accurately fitted. Set of reversible jaws furnished.

* Scroll and Pinions-Made of high grade steel, accurately cut. T handle wrench furnished.

This chuck is quaranteed to run true, is desirable for either Lathe or Screw Machine work.

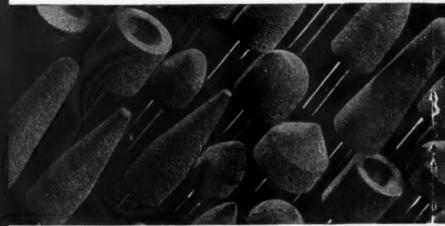
Also Mirrs of Md. Lethe Chucks
Dividing Heads
Fewer Hack Save
Magnetic Chucks
Demagnetizers
Hilling Mech. Visco

L-W CHUCK CO

1-7 N. ST. CLAIR ST.

TOLEDO, OHIO

POLISH 'EM OFF





They're TOUGH and DO their STUFF!

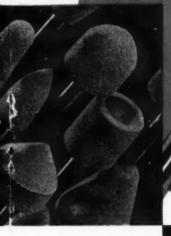
Commandos of the grinding wheel industry—the first small wheels mounted on steel shanks and leading the way today with smoother, more rapid grinding, polishing and finishing of difficult jobs.

Chicago Mounted Wheels—the result of 45 years of KNOW HOW—come in a wide range of styles on different size shanks, for use with any portable or flexible shaft grinder. Several special-formula abrasives give 150% to 300% longer service. More than 200 shapes, all mounted and rarin' to go.

LATEST CATALOG—Packed full of comprehensive information and pictures. You'll be interested. Send for copy.

Soul High Power Catalog	CHI	L A	lius)	NHE	
Free Wheel, Size			Makers of	The second second	-
Address	1101		Monroe		

WITH



TEST WHEEL FREE

If you have a grinding problem, send for a Survey blank, which you'll find easy to fill out. Upon its return, our abrasive engineers will analyze it and send you without charge he was wheel they recommend for your particular job.

HI-POWER GRINDER

Here's a real production tool — a 3-pounder with enough power to drive a 2½" diameter wheel. 17,000 r.p.m. In case with a c c e s s o r i e s, \$38.50.



& MFG. CO.

of HB, Chicago, III.





DRIVE-ALL

Standard Selective Speed Machine Tool Transmission

One of the 17 DRIVE-ALL Models Will Meet Your Requirements

The press of production right now calls for the maximum output from every machine—old or new. Many older machines can be made more productive by individual motorizing with DRIVE-ALL variable speed transmissions. This sturdy, compact transmission can be quickly installed; result, machine control and efficiency vastly improved. The DRIVE-ALL system is engineered to machine tool requirements. Wide speed range covered. Any model is available with clutch.

Write for New Catalog

DRIVE-ALL MANUFACTURING COMPANY

3402 CONNER AVENUE

DETROIT MICHIGAN

Do you realize what your own Distributor is doing to help you keep going today?



Your Industrial Supply House' big, modern Catalog is just as vital to your Purchasing Department as:

- —your marketing records are to your Sales Manager
- -accurate credit information is to your Accounting
- --Production Charts and Cost Shoots are to your Management Executives

--because it provides one indispensable, central point for locating whatever you need in plant equipment and supplies.

Each of these hig books may list 15,000, 25,000 or even more separate items—the Distributor normally carries many thousands of them in stock for immediate delivery to you.

Your Distributor has facilities and a trained staff to give you specialized service—he is in constant touch with scores of manufacturers producing every kind of plant machinery or supplies. He frequently can help your Purchasing Department to locate and expedite the materials you need most to keep your production schedules rolling.

Take the Mill Supply Distributor into your "Company family." He will quickly earn your respect and confidence just as he has earned ours.

Because for many years, Industrial Supply Houses have been our Representatives in selling Cleforge High-Speed Drills and Peerless High-Speed Reamers throughout the United States.



TWIST DRILL COMPANY 1342 EAST 47 STREET CLEVE LAND

30 BEADE ST. NEW YERK 9 NORTH JEFFERSON ST. CHICAGO 646 HOWSED ST. DAY TRANSIS-6015 SECOND BLVD. DETROTY LINGON - E.F. BARRIES, LTD. 25-36-3F SPERFE TRANSES ST. LL.4



CLEVELAND" DISTRIBUTORS EVERYWHERE ARE READY TO SERVE YOU

GET THE JOB DONE!



You can RELY on Marshall-town Presses TO STEP UP YOUR PRODUCTION! They are engineered and built to give you the best in dependable, trouble-free service, and they incorporate many outstanding advantages. Features of design include more die space—chrome molybdenum cranks, wrist pin connections.

Yes, for better production for longer life—for the MOST FOR YOUR MONEY—choose

MARSHALLTOWN PRESSES Get the facts today about Marshalltown

Presses. Send for literature of the complete line capacities from 5 to 70 tons.

MARSHALLTOWN MFG. CO. 900 E. NEVADA ST., MARSHALLTOWN, IOWA

"Let's Talk Shop!"

Precision Nuts Now Broached

A N ingenious broaching set-up which permits rapid broaching of hex flats on nuts requiring high precision is reported to have resulted in more than tripling the production capacity per machine.

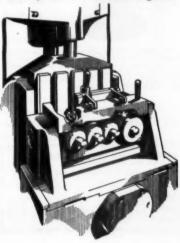
High precision nuts, made from alloy steel rod are widely used for such applications as attaching cylinders to crankcases in aircraft engines, etc. Specifications call for relatively thin walls and flats therefore must be accurately located with reference to threaded portions.



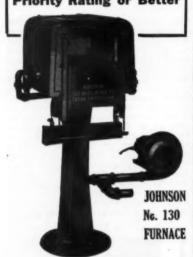
Prior to development of the broaching installation by Colonial Broach Co., Detroit, it was customary to mill flats on the nuts at a lower production rate. An added advantage stated for the broaching setup is relatively greater production between sharpening of broaches, reducing down-time and assuring continuity of production.

The fixture, designed for mounting on a Colonial Senior Press, is unusual in several respects. To obtain the required production a multiple broach set-up was necessary. Also, the time required for loading and unloading had to be reduced to a minimum. A most difficult problem was that of holding the parts during broaching operation, especially since the type of nuts demanded minimum eccentricity, and the hex corners were required to be sharp

with dimensions across flat held to plus or minus 0.002". These requirements in turn indicated that the method used to index the nuts must be both rapid and precise. Four nuts, %-24 thread size, are broached at one time, 3 passes being required to complete the cycle and finish the 6 hex faces of the 4 nuts. Before reaching the broaching operation, nuts are formed on an automatic screw machine, but are not threaded, (Fig. 1), so that they can be mounted on 4 expanding collet shafts or spindles in fixture, as shown in cut-away section in Fig. 2. Five broaches, 3 with 2 sets of cutting teeth travel in slides incorporated in fixture. Indexing is by a hand wheel or knob at right end of hydraulic shuttle-type fixture. The knob simultaneously turns 3 additional collets by means of a train of gears.







Reaches 2300° F. in 22 minutes. Four Johnson burners produce quick, accurate, high temperatures for hi-speed steels, hardening punches, dies and tools. Compactly built to save floor space. Firebox, 13*x13½-x5½, is heavily lined with insulating refractory. \$248 F.O.B. Factory.

Sales Officent

Bourse Bidg., Philadelphia 120 Liberty St., New York City C. B. Babcock Co., 475 11th St., San Francisco

	- FREE Send for Your Catalog						
I	JOHNSON GAS APPLIANCE CO. 514 E. Ave. NW., Codar Rapids, Iona						
1	Please send me Free New Johnson Catalog						
1	Name						
i	Address						
:	City						
ı	Ciale						

Fixture is mounted on a receding type table which automatically shuttles in and out between successive Between each pass cycles. broaches, indexing wheel is turned 1/3 revolution, while broaches are momentarily at top of strokes. After the 3 passes have been made and nuts broached, table moves outward toward operator for unloading and reloading. No indexing is necessary when loading or unloading since gears permit continuous rotation in one direction so that the hand wheel need be turned only while nuts are being broached.

To load, a tilting trunnion is swung outward toward operator, bringing collets into a vertical position. trunnion is tilted in this manner, forward ends of collets, which extend in front of gears, strike bottom plate of fixture. This compresses collet springs and permits 4 unthreaded nuts to be mounted on collet shafts, equipped with serrated collars against which flanged

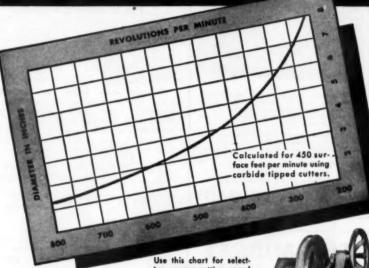
faces of nuts are placed.

Tilting trunnion back into broaching position locks nuts on collet shafts. Inner ends of nuts are also brought against 4 spring studs. Spring studs enter holes in nuts and exert enough pressure to force them securely against serrated collars. Approximately 0.010" extra metal is left on face of each nut so that serration marks (shown in center nut, Fig. 1), can be turned off after nuts are broached.

For indexing, hand wheel is moved 1/3 turn between passes of broaches. Turning the wheel also turns the 3 connecting spindles a similar amount. Three flats of the indexing wheel permit 2 indexing locks to drop into teeth of gears only when they are in proper indexing position. After completing each cycle, shuttle returns automatically to its initial position for indexing.

After nuts are broached, operator pulls trunnion forward, again releasing collets and permitting removal of nuts. Following broaching of the hex faces. nuts are threaded and excess metal provided for the serration marks is removed.

The complete unit includes the broaches, slides in which they are guidHow many S.F.P.M. for Malleable Iron?



ing proper cutting speed
when finish machining
malleable iron.

Convert your pre-war machine tools for high produc-

tion by modernizing with Given Vari-Speed Drives. You get higher spindle speeds without sacrificing slow speeds...you get a new type of control that permits selection of the BEST speed for any job by watching the color of the chip, the feel of the machine. Production increased up to twice original capacity. Units are complete in sizes of 1 to 10 h.p. Bulletin illustrates many installations. Recommendations and estimates furnished upon receiving your list. Write today.





VARI-SPEED DRIVE

SIVEN MACHINEDY COMDANY - 3857 SANTA EF AVE. LOS ANGELES, CALLE

FELL PRECISION



A precision "all-way" level for use in machine to building, setting up and maintenance, whether for catabilahment of level working surfaces or for the accurate checking of straightness where true level itself is not required.

Graduations are in .0005* per foot and form squares about a circular bubble, thus giving coerdinate readings and showing the direction and amount of alope, if any. Made in two sizes—5½*x12*; 3½*x6*.

Write TODAY for bulletin giving full details.

Wm. B. FELL COMPANY 700 South St. Rockford, III.

THE MIDGET



HALF

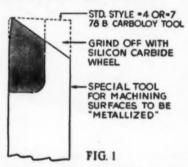
We can supply this Indicator with or without lug on back. Also with support arm for mounting on surface gage. Light weight makes it ideal for use with magnetic base.

Waltham Dial Gage Co. STOW, MASSACHUSETTS

ed, and hydraulic control for the shuttle. The broaches are attached to piston rod of press at their top ends only and pushed thru fixture when broaching.

Pre-Metalizing Finish
Announced by Carboloy Co., Inc.,
Detroit, is a simple tool adaptation for
machining of surfaces to be metallized
—i. e., on which metal is to be sprayed.
The tool doesn't look like it, but it
actually has cured a tough year-old
headache in the metal spraying field.

Trouble arose from the fact that many types of metal do not form a chemical bond when sprayed cn. When that happens it is necessary to roughen the surface of the part to be sprayed in such a manner that a mechanical bond will be formed.



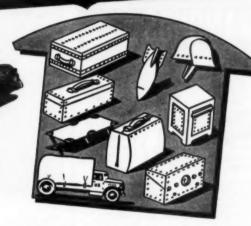
Various tools were developed to do that job over the past year or two: specially knurled tools, dove-tail shaped tools, etc. Those did a pretty good job when base material was easy to machine — and tool life was great enough to stand relatively high cost. But with hard-to-machine alloy steels the job proved a little too tough for these H. S. S. tools, says the firm.

Finally, a user of metallizing equipment got the idea that special tools might be tipped with carbide to give them greater life.

Engineers took one look at the problem and came back with a question: "Why use expensive special tools? . . .

FOR WAR PRODUCTS USE AUTOMATIC RIVETING

WITH TUBULAR & SPLIT RIVETS



IF your problem is fastening metal to metal, fabric to fabric, wood to wood, or any combination, you can do the job better, quicker, and at lower cost with Chicago Single or Multiple Rivet Setters.

SEND SAMPLE ASSEMBLY OR BLUE PRI

Chicago manufacturers complete line of industrial automatic Single and Multiple Rivet Setters for tubular and split rivets. Also aircraft riveters for setting solid aircraft rivets.

RIVET & MACHINE CO. 9610 WEST JACKSON BOULEVARD BELLWOOD, ILLINOIS

If you want to produce a really smooth surface you use a correctly ground tool. Ergo, if you want a really rough one, all you have to do is grind it wrong. Just grind it the opposite from the way you would grind it if you were trying to produce a smooth surface."

After years of wrestling with the problem, the metallizing people couldn't have been blamed for questioning the sanity of anything so "obvious."

The engineers took a standard tool out of stock and, in a minute or so, ground the nose to the unorthodox (to say the least) shape shown in Fig. 1. What happened when they machined a piece of tough alloy steel with it is shown in Fig. 2. The cuts are at different depths (0.010, 0.015, and 0.020 inches respectively) and the feed is approximately 0.030 in.



The surface at extreme right is what the 0.020 depth and 0.030 in. feed produced, continues the announcement. The 'incorrectly ground' tool—in cutting—raised a burr between the tool marks, and the combination of tool angles was such that the tool cutting



AN INEXPENSIVE ABRASIVE BAND GRINDER



Send specifications and prints for prices

on turning and boring form tools.

DIAMOND TOOL COMPANY, Not Inc.

"Built Like A Machine Tool"

The Hormel-M Grinder is stardily built with a supporting leg under the grinding table to eliminate vibration and tipping due to pressure on belt. Ball bearing throughout, equipped with Alemite lubrication, complete with grease gun.

Write for illustrated folder on this and other styles and sizes.

WALLS SALES CORP.
96 Warren St., New York, N. Y.



PATENT
APPLIED FOR
Designed by
Francis E.
Brady, Jr.,
Hydraulic
Engineer.
Consultant
to many
machine
tool manufacturers.

The most adaptable pump of all ... MODEL 7500 by BRADY-PENROD, INC.1 This pump may be made an integral part of any grinder, lathe, cutting or drilling machine or can be easily moved from job to job as needed. A plate adapter is available to fit any tank or base opening. This model is a motor-driven open-impeller centrifugal type, submergable, with an outside discharge. Internal piping is eliminated; external piping reduced to a minimum. This simplification saves engineering and assembly labor.

THREE DEPTHS SUITABLE FOR ALL MACHINES

MODEL 7500 is available with 3 different depths from flange - 4%", 9", and 15".

Motor capacity - 1/4 H.P. to 11/4 H.P.

Controlled flow - from 4 g.p.m. to 100 g.p.m. with any standard coolant fluid. <u>Suitable for use with abra-</u> sives, Special depths available.

Long used as standard equipment by machine tool manufacturers, BRADY-PENROD Pumps (<u>6 other</u> models) are proving their reliability and high hydraulic efficiency in hundreds of locations today. Write or wire for details.

Brady Taned

INCORPORATES

1210 W. SECOND STREET MUNCIE, INDIANA, U. S. Ac

IT WILL PAY YOU TO INVESTIGATE OUR PRECISION TOOLS!



M & L No. 1 Precision Tapper

Efficient and Accurate

Taps guided by precision leads.

Used by many large U.S. manufacturers.

Available in pedestal or bench models

Precision tapping on a production basis. Class 3 and 4 specifications easily met. A high quality machine with 4 speeds, 95 to 395 RPM and dial indicator for bottom tapping. Ball bearings throughout. Equipped with coolant pump system. No stilled operators necessary—sensitive touch—minimizes rejects.

INTERNATIONAL INSIDE MICROMETERS



HIGHEST ACCURA-CY AND PINEST WORKMANSHIP

Available in 2 sets: 11/4"-6" and 11/4"-12" including case and han-dle. Accuracy un-

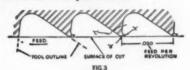
conditionally guaranteed.

M & L POSITIVE OFFSET BORING HEAD 0-15". New "HANDY KNURLER", used like pair of pliers. BRAND TELESCOPE GAGES ½" - 2½" capacity.

Write for complete information to:

BRAND TOOL & SUPPLY CO.

formerly Pacific Tool & Supply C 344 N. Vermont Ave Los Angeles, Cal. pressure pushed the burr over into horizontal position. Photograph (Fig. 2) and drawing ("C" in Fig. 3) show that the tool also lifts some of the crests intermittently, thereby produc-ing a mottled surface forming a base for adhesion of sprayed metal. Incidentally cutting speed on this tough material was well up-around 200 to 250 surface ft. per minute.



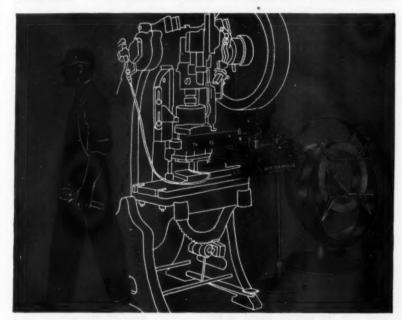
A thing to wonder about is what happens when a man who has been preaching for a long time how much smoother a finish you can get with correctly ground tools, now recommends incorrect grinding to do a better job of finishing a surface-even for metallizing.

Jig Centers Variable-Diameter Round Work

In handling short pieces of rods, shafting, or like work, when end drilling, or when milling cross-slits or other end cuts that require relatively accurate centering, the jig shown will be found very useful, especially when the work being done varies to some extent in diameter. This jig will locate all round work central which falls within its scope. It may be made of any desired size, to accommodate relatively small diameters of work. Lugs are to be provided on the outer shell of the device for bolting to the machine table, tho these are not shown.

Fig. 1 is a top view of the device. while Fig. 2 shows a section broken thru to reveal the working principle. The outer portion is of the shell or cup type, as shown by the reference letter A, and is bored thru on the bottom at B with a sizable hole so that it can clean itself of chips, and is in-ternally threaded as at C. If a great deal of power is desired on the clamping action of the device, to withstand torsional pull of a relatively large diWAR PRODUCTION rolls out faster with

WITTEK Automatic ROLL FEEDS AND REEL STANDS



The major problem confronting industry today is increased war production. Manufacturers of metal stampings must recognize automatic feeding of coiled strip stock to punch presses as vital to the solution of their problem. Wittek Automatic Roll Feeds and Reel Stands are designed and built by engineers with years of experience to guide them. With Wittek you can conserve man-hours and maintain new high production schedules.

★ Write for Descriptive Catalog

WITTEK MANUFACTURING CO., 4305-15 W. 24th Pl., Chicago, Ill.

to

cse

n-gh to

at en ch th ds bl-

ls, lor ly ill en e ls of

e,

e.

or

æ

-

at

-



DIE-LESS DUPLICATING

The parts shown are typical of the great variety of simple or intricate forms and shapes which can be quickly duplicated to a tolerance of .001° with DI-ACRO Precision Machines—Shears, Brakes, Benders, For experimental and research work or production runs, DI-ACRO Units form angle, channel, tube, rod, moulding, wire, strip stock; shear stock sheets, trim duplicated stampings. With Diecated stampings.

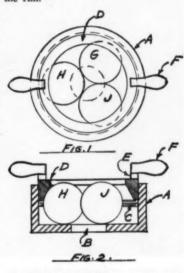
moulding, wire, strip stock; shear stock sheets, trim duplicated stampings. With Die-Leas Duplicating, die expense and time are frequently saved. Send for Catalog—"Metal Duplicating Without Dies".



O'NEIL-IRWIN MFG. CO. 314 8th Avenue So. Minneapolis, Minn.

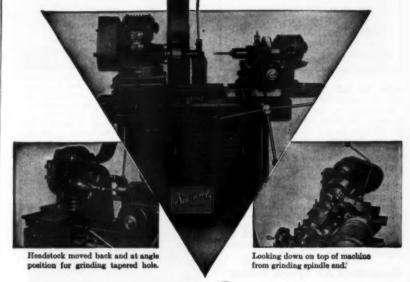
ameter drill, the threading as at C should be made quite fine. But if the device is to be used on some duty where but little torsional pull will be set . up, a coarser thread will give greater speed in the closing and opening action. In cases where it is desirable for repetitive work on stock of equal length, where even depth of drilling or of cut is wanted, a studtype stop (not shown) may be arranged over the center of the hole B, upon which the end of the workpieces may be directly set. Such a stop will be right-angular, and will either attach to the inside bottom of A, extending out between two of the balls, or it may attach to the machine table, in one of the slots, and extend upward thru the hole B. Such a stop may have telescopic adjustment, if desired, for handling different lengths of work.

The other main portion of the jig shown is a heavy ring of steel as D, turned inside and outside, fitted with a beveled face angling at about 30 degrees from vertical, on the inside as shown, and externally threaded to screw into the internal thread of the part A. To the top edge of the ring D, at points diametrically opposed, are welded small cubic blocks of steel as E, to provide risers for welding on the handles F. This arrangement throws the handles F high enough above the shell or A to give full use of the threaded adjustment. Obviously, the blocks E must be carefully set, so they will not extend outward far enough to engage the threading on the inside of A if they are screwed down past the rim.



The three balls GHJ are turned and set into the outer shell A before the ring D is finally assembled to it. Fig. 2 has been projected from Fig. 1, in order that a true view might be obtained of the working principle on one of the balls, namely H. In Fig. 2, ball J would bear directly against the bevel of the ring D on that side toward the reader, if the ring were unbroken, and

Sav-way MULTI-PURPOSE INTERNAL GRINDER



Offers greater flexibility...a precision grinder, designed and built by engineers with years of practical experience to guide them...has a headstock traverse of 6"...grinds holes ¼" to 18" in diameter...holes up to 9" deep, straight or tapered...entire headstock may be moved at right angle to wheel traverse, by merely loosening two conveniently located nuts...worm compensating device permits grinding wheel head adjustment to .0001...sturdy construction throughout... full specifications, delivery time and price on request.

Distributors throughout the U.S. and Canada to serve you.



Screw Machine Cams

IMMEDIATE DELIVERY

George L. Detterbeck Co. Formerly Banner Mfg. Co.

1871 Clybourn Ave.

: Chicago, III.

since the ball G is precisely behind ball J, it does not appear in Fig. 2.

In operation, the workpiece is held between the three balls. Looking down on the ring D, it is spun anti-clockwise by the handles F, lifting the beveled face of the ring out of contact with the balls GHJ and allowing them to spread apart as a workpiece is thrust down in the center between them. The ring D is then turned clockwise until the balls are driven inward to the point where they grip the workpiece tightly, and it is automatically centered at the same time. The balls will automatically take positions 120 degrees apart and center the work, if it is cylindrical, regardless of its diameter.

Compressed Air Speeds Testing

Bomber part testing has been speeded greatly by Brewster Aeronautical Corporation engineers. This speed-up in testing is possible thru a device known as a Comparator which operates in connection with a Rockwell Hardness Gauge. Since every structural part of a bomber must be strength tested, the production time saved thru the new device is said to be important.

Russell Gross of the Compressed Air Institute, with whom E. J. Shildkret, engineer and codesigner of the device, discussed this new compressed air application, explains it thus:—the Comparator is used as an accessory to the Rockwell Gauge. It comprises a table-mounted yoke which supports a penetrator placed over an anvil. The die end of the penetrator is of the same size as that used in the Rockwell Gauge. The anvil moves upward



against the penetrator under pressure of a piston operated by compressed air under 100 psi. A piece being tested is thus pressed against the spherical die with pressure sufficient to indent its surface. Depth of indentation is shown by a Starrett Dial Indicator which records any upward motion of the die. The softer the metal, the greater the indentation. Foot controlled air valve allows the operator free use of both hands.



To test a number of similar parts; one of correct hardness as determined by the Rockwell Gauge, is used to calibrate the Comparator. This piece is



NO.2 AMERICAN PLAIN MILLING MACHINE



PROMPT DELIVERY

MOTOR IN BASE DRIVE

INFINITE SPINDLE SPEEDS

STANDARD SPINDLE NOSE

HEAVY RUGGED CONSTRUCTION

CENTRALIZED CONTROLS

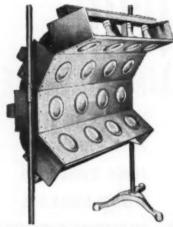
SEND FOR DESCRIPTIVE BULLETIN

J. L. LUCAS and SON INC. Bridgeport, Conn. U.S.A. subjected to pressure in the Comparator at which time position of the indicator needle is noted. Subsequent pieces, if of proper hardness should give the same reading. If too soft, the die penetrates more deeply causing the needle to pass the established reading. To facilitate reading, a segment of the dial is marked in red—the reject area.

Women do all this testing at Brewster, where their dexterity and quick

eves are advantageous.

Infra-Red Dryer



With infra-red tunnel-drying gaining daily among new applications aimed to speed vital war production, announcement of patent-Flex Tunnel assemblies by Wilson Mfg. Corp., 152 W. Erie St., Chicago, is well-timed.

In addition to compactness in design and simplicity of adjustment features, the makers claim important advantages in flexibility, elimination of tunnel-design engineering, speed of job-setup, conservation in space and ease of installation.

It is claimed, also, that the apparatus requires no preheating, operating actively as soon as the lights are turned on. Instant changeover from dissimilar jobs is possible, according to the firm.

The units are designed to use 250-watt R-40 type reflector heat-drying lamps, with built in reflectors which do not need cleaning, maintaining full efficiency thruout their life. Lamps have fixed focus for high-energy concentration, and are spaced on 8½" centers to provide even heat-distribution.

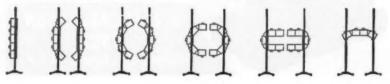
Complete tunnel enclosure is obtained thru close hinging of lamprows and close-fitting baffle plates around lamps. This arrangement is said to re-direct heat rays and retain heat within enclosure, for greater efficiency, as well as to reduce temperature of lamp base sockets and wir-

Detailed information is available in

a new bulletin.

Lathe Handbook

"The Care and Operation of a Lathe" published by the Sheldon Machine Co., Inc., 4242 N. Knox Ave., Chicago, is a pocket size, paper covered manual, written for the apprentice or student machinist. It illustrates and explains: -The modern back-geared, screw cutting lathe; its parts and their functions; oiling and proper care of a lathe; the grinding of cutters; modern lathe tools; holding the work; and the performance of basic lathe operations. While not a "shop kink" book or a handbook of tables, this manual has the essential "do's and don'ts," is well illustrated and exceptionally complete in its tool grinding charts. Price single copies 50c with discounts for schools or other quantity buyers.





SAVE TIME AND MONEY THESE 5 DIFFERENT WAYS

ip, nnged ar n. 0-

h

n.

es is

r

n

is

1.

nt

5:

2;

e

-

S.

a

e

n

e

This small compact electric furnace is inexpensive, handy and easy to operate ideal for small tool and die shops—saves time these five different ways:

- 1 Eliminates delays in sending small machine parts out to overcrowded commercial heat treaters.
- 2 Saves time and expense of drawing or tempering small metal parts in large furnaces.
- 3 Cuts handling time when normalizing or annealing small parts. No waiting.
- 4 Conveniently available for pre-heating for subsequent high-speed hardening.
- 5 Eliminates shut downs and delays in servicing emergency repair orders.

AVAILABLE IN TWO SIZES

Type	Chamber Capacity	Amps 115 V	Watts	Amps 230 V	Price	
MH-3	8"W 6"H 14"L	29.6	3400	14.8	\$124.00*	
MH-4	10"W 6"H 18"L		4800	20.9	\$191.00*	

*Includes Hearth Plate

MAX. SAFE TEMPERATURE—Continuous operation, 1750° F.; Intermittent operation, 1850° F.

AUTOMATIC CONTROL—Indicating Controlling Pyrometer—Thermo-couple and lead wire complete—\$142.40.



REPLACEABLE HEATING ELEMENTS—Replaceable nickel chromium resistors embedded in rectangular refactory blocks. Elements form inner walls of furnace chamber, and may be replaced easily and quickly after removing rear panel—furnace structure remains undisturbed.

FREE Complete data covering specifications, addi-

tional applications and ordering instructions are included in this new folder. Write for your copy today. Ask for Bulletin No. 50.



COOLEY ELECTRIC MANUFACTURING CORP., 213 S. SENATE AVENUE - INDIANAPOLIS, IND.



PEATURES

In your own plant-under your own production conditionsmount a MOTOR TOOL LIVE CENTER firmly against the work

Start it spinning. Keep it going all day-all night-all weekall month. You'll find it won't heat up or burn out. Neither will the work, no matter what the material. Here's why.

Unlike dead centers, MOTOR TOOL LIVE CENTERS revolve with the work on both ball and roller bearings. In addition they are lubricated. FRICTION, the cause of burning out, is

Aircraft, Army and Navy engineers, as well as those in private industry, have been quick to realize the greater economy of MOTOR TOOL LIVE CENTERS. With proper care they will last for a lifetime of continuous, care-free service.



"Tooling Up" for



J. & L. Announces New Turret Lathes

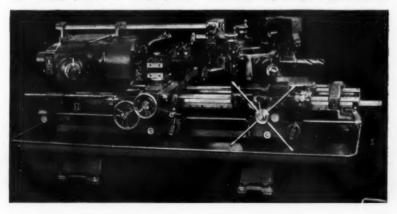
A FTER extensive research, experimentation and a long period of testing, the Jones & Lamson Machine Co., Springfield, Vermont has put into production its new 9A and 10A Saddle Type Universal Turret Lathes. The No. 9A machine has a maximum round bar capacity of 3½" and will swing 23½" over the way covers. The 10A machine has a maximum round bar capacity of 5" and will swing 21½" over the way covers.

These machines are said to embody all the labor and time-saving features that characterize all other Jones & Lamson Lathes, and new cost-reducing, labor-saving and production features have been added. Notable among these is power traversing of the saddle and power indexing of the hexagon turret, both operated by one lever, through which both high and low positive traversing speeds can be obtained.

For many years this company has

equipped all its saddle type turret lathes with power indexing for the hexagon turret to help reduce operator fatigue and to promote greater efficiency in operation of the machines. Moreover, power traversing and power indexing of the hexagon turret has allowed the No. 9A and No. 10A machines to be provided with particularly heavy walled turrets that allow bigger than normal boring bars to be supported without need of pilots. Additional support for the multiple turning heads is provided by a heavy stationary pilot bar mounted on the headstock.

Another important feature is the massive design of both these machines. The bed is of an improved double-wall box-ribbed design, and is 17" across ways on No. 9A machine; and 20" across ways on the No. 10 machine; giving great strength and a solid, rigid support for both carriage and saddle. Special provision has been



made for easy and efficient chip disposal.

The heavy-duty headstock is provided with anti-friction transmission and spindle bearings thruout.

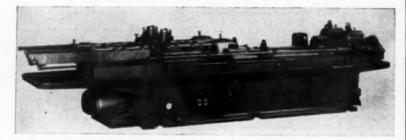
Another helpful feature is the builtin power rapid traverse for the bridge
type carriage and cross slide. This embodies an all-gear drive and is operated by a single lever thru which all
4 movements of carriage and cross
slide, or a combination of these movements can be obtained. This is said
to be an innovation in turret lathe design that increases production and
eliminates much tiresome hand cranking, allowing multiple tooling on both

front and rear of cross slide to be used to greatest possible advantage.

Single lever speed and feed selectors, coolant supplied under pressure directly to working face of hexagon turret and many other labor-saving, economy-producing features, standard in other J. & L. lathes are, of course, included in these new models.

The bar-feed mechanism for this machine is power operated. A reversible torque motor controlled by an electric switch located on headstock of machine within easy reach of operator, acuates the stock feed chuck lead screw thru a gear train and either advances or withdraws the stock as required.

Rifling Machine for 30 and 50 Caliber Rifles



The Ex-Cell-O rifling machine manufactured by The Foote Burt Co., Cleveland, is of the electrically controlled and hydraulically operated type. It has 2 operating stations, each fully independent of the other. The 2 main slide bases are mounted on a long cabinet type base.

Hydraulic reservoir and control panels are located in end of base. Coolant tank and electrical panels are in

the other end.

Each slide base supports 8 units, viz: (1) Index Unit—Gun barrel is located and locked thru ball bearing journalled index spindle. This unit is indexed to change engagement of the cutting tool from one rifling groove with another.

(2) Tail Stock—Supports small end of gun barrel. It is provided with a motor driven wiper to remove chips from tool bar and shock spring retained finger to retract cutting tool before return stroke.

(3) Sliding Head—Tool bar is supported and receives an endwise and a rotating movement from sliding head. Sliding head actuates tool-feed and index operating bar.

(4) Cylinder—Hydraulic cylinder is mounted at rear of machine. It actuates thru piston rod the sliding head.

(5) Lead Rollers—Lead rollers are mounted directly in front of hydraulic cylinder. They are adjustable for height and to suit helix angle.

(6) Lead bar is supported at rear by a sliding guide bracket. At front it is provided with a driving connection to sliding head. Because of its contact with lead rollers, it rotates driving head and tool bar during endwise movement.



Information supplied by National Fire Protection Association

The surest way of preventing cutting and welding fires is to keep flames, sparks, molten stag and hot metal away from flammable materials. This elementary precaution is the one most often ignored.

There are other precautions which, if observed, will do much to prevent cutting fires.

- Always check fire hazards in new locations before starting work.
- Have precautions in individual cases specified by responsible authority.
- Move combustible material at least 30 to 40 feet away from cutting operation.

- Sweep floors clean before lighting the torch.
- 5. If combustible material cannot be moved, or if sparks or slag may lodge in wooden structures, or drop through pipes or holes to floor below, use sheet metal guards, asbestos paper or curtains to localize flying sparks or slag.
- Before cutting steel or iron be sure that it will not drop on combustible material.
- When finished check surroundings thoroughly to make sure all smouldering sparks are put out.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Clima Ty On Im The pany

be

in

e s u (7) Steady Rest—Tool bar is supported between tail stock and sliding head by steady rest which is supported on slide base directly in front of slid-

ing head.

(8) Cutter Feed Unit—After each cut thru all rifling grooves on diameter of barrel, tool is fed an adjustable amount by cutter feed unit. This unit is mounted stationary at front of slide base. Feed member is built into a swinging arm which is removed for loading barrels.

Coolant tank has a capacity of 50 gallons. Flow of coolant is controlled by coolant relief and coolant flow valve. Relief valve is mounted on side of coolant motor. It is adjusted to 15 to 30 lbs/in. Flow valve is mounted on side of slide bracket toward center of ma-

chine.

Hydraulic tank capacity is 40 gallons. Hydraulic system provides an infinitely adjustable rate of travel in each direction. Near end of stroke this rate is reduced, if it exceeds a certain maximum rate desirable to operate feeding and indexing mechanism satisfactorily.

A choice of 2 hydraulic pressures is available. Low pressure to operate machine with satisfactory cutters and a higher pressure to finish cut after tool becomes dull and stalls machine.

Cutter bar comprises cutter head assembly and cutter bar extension. It is retained in adapter which is held in taper nose of sliding head spindle.

Unit for 30 caliber only, takes 30" barrels: 30 and 50 caliber unit takes 50"

barrels.

Machine for 30 caliber only is 44" wide, 162" long, 41" floor to center line of barrel and approximate net weight is 12.000 lbs.

Unit for 30 and 50 caliber is 44" wide, 218" long, 45-1/2" floor to center line of barrel and approximate net weight is 16.500 lbs.

Vonnegut Armor Plate Grinder



Noteworthy among new tools developed to speed arms production is the Vonnegut LG Type Armor Plate Grinder illustrated, designed, constructed and shipped to a division of General Motors in less than 100 days and using less than half of the critical materials that might be needed for a machine of similar capacity but of more conventional

design. It is one of a series being built by the Vonnegut Moulder Corp., 1805 Madison Ave., Indianapolis, manufacturers of the Marschke Line of industrial grinders and buffers.

Consisting essentially of stationary grinder unit, 45 foot tracks and twin traveling work tables, the grinder bevels straight line edges of armor plate SPEEDS UP TO 23,000 R.P.M.

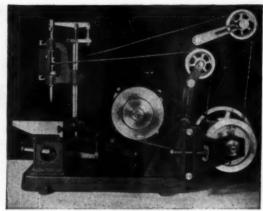
rate

ding rily. s is

mad a tool ast is

30" 50" 44" ine ght de, of

NEW



Super sensitive DRILL PRESS

The NEW Lord & Davis Super Sensitive Drill Press offers convenient finger-tip control, precision, balanced construction, and speeds up to 23,000 R.P.M.—all vitally important for drilling holes from 1/16" down to .004" (or smaller) in diameter.

The sesitivity is attained by balancing the spindle by means of the vertical component of the belt tension. This accurately transmits the "feel" of even the tiniest drills to the finger-tip control. Drill breakage is thus reduced to a minimum.

Machines with one, two, three, or four spindles are available. Mail the coupon today for details !

Please send me	complete	details	on	the	Super
Sensitive Drill	Press.				

NAME TITLE

COMPANY

STREET

EDWARD BLAKE COMPANY

634 COMMONWEALTH AVE., NEWTON CENTRE, MASS.

J-B TAP GRINDERS — FILTAIRE PORTABLE DUST COLLECTORS — AMERI-CAN TOOL HOLDERS — BLACK DIAMOND PRECISION DRILL GRINDERS THE ILLUSTRATIONS—On the preceding page is shown an angle front view of the left hand section of the Vonnegut Armor Plate Grinder. At the right on this page is a rear view. The small insert at bottom of the page shows the complete machine.



preparatory to arc welding into the shells of tanks and armored cars.

Excellent cutting is provided by 36" diameter abrasive chuck wheel supported on a 6" diameter spindle in long tapered babbitted bearings with ball bearing thrust collar and powered thru 8 strands of V-belts from a 40 hp motor.

The 2 work tables are adjusted angularly by means of heavy screws to provide for edge bevels of from 90 to 25 degrees. One table is operated while the other is being unloaded, loaded, and set up, thus, providing for almost continuous production. Tables travel on ball bearing rollers, upon hardened steel tracks. Upper rollers and tracks are set at proper angles to resist the grinding wheel forces.

Table travel is actuated by a cable



drive with choice of 25, 30 or 35 feet per minute rate of feed. Each table is connected or disconnected from the cable by quick acting clamps. Cable power is supplied by a 3 hp motor driving a cable drum thru a pair of reversing friction clutches, speed reduction gears, chains and sprockets. Coolant pump is driven by a 1 hp motor. All 3 motors have push button control.

The grinder is shown set up on a skeleton frame for test purposes. Installed, however, its I-beam track rails and grinder units are mounted on a concrete foundation.

As a result of this departure in machine design, plus the extensive use of welded structural steel, it is estimated that the machine incorporates less than half the amount of steel employed in other armor plate grinders of similar capacity. Moreover, by use of stock transmission items it can be built in half the time, and provides design flexibility needed for varied armor plate sizes and patterns.

Despite crowded manufacturing and engineering schedules, the first machine with 45 x 12 x 8 feet superstructure and weighing 25,000 pounds was shipped within approximately 3 months after first consideration of design.



Canedy-Otto has been the manufacturer of first-class, high-grade drilling units since 1892. These units are available in single spindle, multiple spindle and radial.

We can help you solve your drilling problems. Send for information on our complete line

Early delivery possible.

SPECIFICATIONS:

Drills to the center of circle on base or table Length of arm Greatest distance from spindle to base Minimum distance from spindle to base Minimum distance from spindle to column Traverse of spindle

Spinsis speeds with 1800 RPM motor

Foods per revolution of spindle

ring of arm on column of main driving motor ght of drill column over gears king Surface of Base

3º Arm	4' Arm	1	5' /	rm Lm
791"	94"	-	120	2"
481"	48"		4	**
101-	10"		10	
No. 4	No. 4		No.	4
251"	96" 4' 48" 15" 10" 91" No. 4		48	4
211" (60, 85, 13	0, 180,	en	ali	models
(425, 580, (1200 RPM	860,			
(85, 130, 1) (560, 860,	80, <i>2</i> 74, 1160,	on	all	models
3" 48 3" 9 4" 9 4" 9 4" 9 4" 9 4" 9 4" 9 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	AP	on	ali	models
14"	16"	18"		
2 HP.	2 HP.	2 HP.		
29"x45" 4000 lbs.	2 HP. 98" 36"x80" 6200 lbs.	7	000	lbe.

CANEDY-OTTO MFG. CO. CHICAGO HEIGHTS. ILLINOIS



Save tooling time. Build your fixtures around a completely pre-designed drill jig body.

Save production costs. Savings up to 60% in drilling time not uncommon. Lever locks work instantly—holds securely. Throw it back and work is released. No complicated adjustments. Save cost of expensive drill fixtures—just a bushing plate and adaptor needed for each job.

Order today. Please include contract number or priority certificate. Write for bulletin.

Mohr Lino-Saw Co.

130 N. Union Ave. Chicago, III.

INCLINABLE POWER PRESSES

Write for Literature

L & J PRESS CORP.

SUCCESSORS IN Lashback-Jordan Tonl & Machine Co.

1825 STERLING AVE ELKHART INDIANA

Gisholt Expands Balancing Machine Range

Stimulated by industry's wartime production requirements, Gisholt development engineers have broadened the over-all range of the Dynetric Balancing Machine line to extremes of 1 ounce and 50 tons, according to a recent announcement.



This expansion of effective static and dynamic balancing capacity, proving the flexibility of the fundamental Dynetric principle, has been brought about by 2 major developments:

(1) The new Gisholt Floor Type Dynetric Balancing Machine, built to balance parts up to 100,000 pounds in weight, 240" in length, with 200" swing,

has passed all tests and is now in use;
(2) The Gisholt Type S Dynetric, first to be manufactured and smallest of the entire line, has been perfected to balance parts weighing as little as one ounce.

Further information on the complete line, now capable of correcting static and dynamic unbalance to reduce wear and prolong life in parts of any size, is available from Gisholt Machine Co., 1185 E. Washington Ave., Madison, Wis.



323 Berry St.

Brooklyn, N. Y.



Life for Workers and Machinery

when you install - - -

me leled al-1

nd

ng

yut

ıl-

in

ng, ie;

ic.

est

as

te ic ar e,

o., is.

TORIT DUST COLLECTORS

Abrasive dust and grit permitted to circulate at large wherever men and machines are at work will cause untold damage both to machines and to health of employees.

TORIT Self-contained DUST COLLECTORS attached to grinding, buffing and cut-off machines will efficiently and economically trap this dust hazard. TORITS are portable—may be placed wherever needed.



Write for bulletin giving the TORIT features, specifications, and prices. We will gladly help you solve your dust control problem.

TORIT
MANUFACTURING CO.
303 Walnut Street
St. Paul, Minnesota

TORIT Dust Collectors

Gear World

Anyone familiar with gearing can largely determine the state of civilization a particular nation has attained, thru study of their mechanisms. So says S. M. Ransome, writing in B-C-A News, organ of Barber-Colman Co .. Rockford, Ill., in an interesting historical sidelight on gears as related to human progress thruout the ages.

As need for power and motion grew, forms of gears were developed to meet the need. Water-supply seems first to have involved the use of mechanical devices employing gears. They were known and used by early Chinese, Hindu. Egyptian and other peoples. Their gears were usually made of wooden rings in which pins of wood were inserted, to form the teeth. The lantern gear of today,

used mainly in clock-making was later developed in this manner.

Even the worm-gear is of hoary antiquity, according to Ransome's researches. Such a spiral was studied by Archimides (287-212 BC). Designs for what was undoubtedly a forerunner of the auto of today, dating from the 16th Century still exist. One, in particular, by Durer, was propelled by all four wheels, each actuated by a perfect worm gear.



DOUGLAS MACHINERY CO. INC.

Two or three hundred years ago, the first metal gear came into being. It was made of cast-iron, with the teeth integral, and filed down to remove burrs. Cast gears were in use as late as 60 years ago, mainly as back-gears for lathes, and gears for planers, shapers and other machines. The greatest objection to them was that they could be used only for relatively slow pitch line-velocities due to excessive noise and vibration. This drawback was met



No matter how tough your schedules are to meet—LIMA GEARSHIFT DRIVES will help you do the job. Whether its turning, milling, boring, planing, punching, shaping, gear hobbing, etc., Lima Gearshift Drives have been engineered to do the work with Speed and Accuracy. Built in sizes from 1 to 25 H.P., either direct motor or belt driven. Speeds up to 8 forward and 8 reverse. Standard mounting brackets available for most standard markines.

LIMA'S many important features have all been designed to meet specific requirements in the unit motorization of production equipment and to maintain Speed with Safety. Unsolicited letters of recommendation show that Lima Gearshift Drives are stepping up production from 20% on some types of work to 200% and over on other types. Why not investigate immediately the possibility of stepping up your production with Lima

Gearshift Drives. Consult our engineers – their experience is yours for the asking in this common cause. BEAT PRO-DUCTION SCHEDULES with LIMA GEARSHIFT DRIVES.

REMEMBER! Increased Operator Efficiency means Increased Production so vitally necessary today.

Write or wire us today Prompt attention to inquiries . . . Prompt Deliveries on Orders.

DNIF-PRODUCT THE LIMA ELECTRIC MOTOR CO. EXPLOSION - PRODUCTION OF STREET OF

SEND TODAY FOR FREE

DESCRIPTIVE, ILLUSTRATED

BULLETING AND DATA SHEETS.



by using mating gears with wooden teeth,

About 50 years ago, the period of the machined-gear was born.

Today, the demand for specific-purpose gears is myriad, from paper-thin, for use in small wrist watches, to 20-ft. multi-ton giants in battleships.

Jefferson Bulletin

Announced as just off the press, a new bulletin by Jefferson Machine Tool Co., 700 W. 4th St., Cincinnati, O., gives completely illustrated data and details on its line. Included are precision milling machines and attachments, turret conversion attachments for lathes, endless belt sanders, swingframe grinders and polishers, and gyratory riddles.

Front-page emphasis is given to the firm's Bulldog Precision milling machines, in motor and hand lever feed types, almed to speed up milling jobs. To widen scope of their usefulness, a variety of standard attachments is provided, the more important of which are also illustrated and detailed.



MOREY 8" VERTICAL SHAPER

EQUALLY EFFICIENT IN YOUR TOOL ROOM OR MANUFACTURING DEPARTMENT

FEATURES:

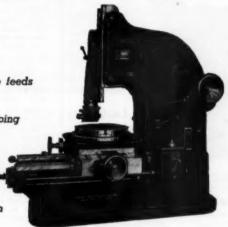
PRECISION

POWER rapid traverse feeds in all directions

BRAKES for quick stopping

BIJUR LUBRICATION

TIMKEN BEARINGS—
Bull gear mounted on Timken bearings •
Roller table mounted on Timken bearings



CUTTING STROKE and FEED instantly available by single levers • Stroke immediately adjustable, automatically locked

MODERN DESIGN—easy to operate—built to highest standards • Finest materials

POWERFUL-yet finger-tip control throughout

WE ALSO BUILD THIS SHAPER IN 12" AND 14" SIZES ASE FOR CIRCULAR No. 726

DESIGNED AND SEILS BY

MOREY MACHINERY CO., INC

410 BROOME STREET . NEW YORK, N. 1

T. H. L. FRONT LEVER

BENCH PUNCH

Capacity — 1/2* holes through 3/16* steel; 13/32* through 1/4* steel. Can also be made for holes up to 7/8* in thinner metal. Stock punches and dies available from 1/16 to 1/2*by64ths.Weight, 70 lbs.

Machine Co.

(Est. 1890)

311 E 47th St.,
NEW YORK



Writes on hardened steel — demagnetizes at the same time—with carbon point does light spot annealing and soldering jobs. Compact easy to use—dependable.

Send for details-5-day FREE TRIAL OFFER!

Luma Electric Equipment Co. Dept. H-Main P. O. Box 132, Toledo, Ohio

Novel Drilling Demonstration

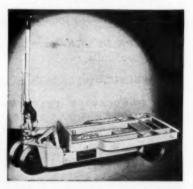
When industry's "men-who-must-know-how" gather at the Foremen's National Convention, Hotel Sherman, Chicago, September 25-26, they will witness an unusual drilling demonstration of a comparatively new material—"Hardsteel" now available in drills, reamers and tool bits.

Foremen from industrial plants are invited to bring to the convention, actual shop samples of hardened steels and steel pieces that they have had trouble drilling with conventional drills—or that they have found impossible to drill in the hardened state.

"Hardsteel" will drill materials having a Rockwell "C" hardness of 40 or higher on an ordinary drill press, and will send foremen home with new ideas for faster war production. By a simple change of shop practice, many items, where rejects now are high because of distortion caused by hardening after machine time has been put on the work, can be full hardened, then drilled, reamed, countersunk and machined.

The manufacturer, Black Drill Co., 5005 Euclid Ave., Cleveland, Ohio invites samples for drilling at the convention.

West Bend Lift Truck



Filling out their present line of Weld-Bilt Hydraulic Lift Trucks, West Bend

225



ı's n. ilĺ

als. re cls ad ls

le

or

be w a

v e-1-

ut d. nd

1-

Bring your screw machines up to-date. No bushings required - Quick set-up - Quick change of drill sizes - Perfect holes - Faster production.

WRITE FOR CATALOG

ALCO TOOL COMPANY

BARTELT TOOL SETTING GAUGE



ADVANTAGES:-

Saves labor and machining time. Eliminates oversize holes. Saves scraping at time of assembly, Eliminates trial boring.

The BARTELT TOOL SETTING GAUGE

provides speedy, accurate setting of boring tools as well as many other tool settings and related applications.

The gauge may be had with either a micrometer or a dial indicator for exact tool setting.

WRITE TODAY FOR FURTHER INFORMATION.

COMPANY

1214 PARTRIDGE AVE.

BELOIT, WISCONSIN



THE GRANT MFG. & MACHINE CO. C. E. Station. Bridgeport, Conn.

Riveters are available in Noiseless Spinning and Vibrating Hammer types, also Vertical and Horizontal Multiple Spindle Spinning Ma-chines. Information? Write!



11 MONTAUK ST. BRIDGEPORT.

HIGH SPEED

VERTICAL MILLING MACHINE AND JIG BORER

WITH MICROMETER SCREW FEED QUILL

This machine is ideal for tool, die, fixture and pattern work. Is versatile and accurate. crometer screw feed quill. Direct reading eliminates pen-cil figuring and possible errors. Smooth accurate boring is assured to any pre-determined depth to 3.

Write for descriptive Bulletin.



TRICO FUSE MFG. CO Equipment Corp., West Bend, Wis. announce a new 10,000 lb capacity Heavy

Duty, Model L. Of special interest is the fact that the horizontally mounted hydraulic unit, of special heavy duty type, is interchangeable, quickly removed without special tools, permitting easy replacement after years of service.

Made in both narrow and wide platform sizes, the new Model L has frames, wheels and lifting mechanism of extra heavy construction, capable of sustaining much heavier loads than the specified rating. Moving parts are equipped with ball or roller bearings. Steel frames are complete arc-welded and heavily crossbraced for extra rigidity and strength. It is available in a wide variety of sizes, heights and widths.

The new "Weld-Bilt" Truck is announced to Industry in a new catalog No. 242 covering the complete line of Hydraulic Lift Trucks, as well as recent developments in standard and special skid platforms.

Ohmer Tool Control

Tool conservation and control, vital to the war effort, are facilitated by the Ohmer Tool Control, product of Ohmer Register Co., Dayton, O. The machine operates on the cash-register principle, issuing receipts and keeping mechanical records of transactions at the store-room counter. Unit, row, bin and employee's numbers are shown. In addition to this protection for employee and firm, the records afford management important facts as to when and where the tools are in use and by whom. A new bulletin gives full information.

Good Light

Good lighting in a plant or office is not enough. An extreme example of a bad situation is a man working on a black object black against a That machine. can cause eve-Evestrain strain. can cause acci-dents and lower morale.

Faber Birren, industrial color consultant writing in Dun's Review and Architectural Forum, says.

A worker standing at a lathe may suffer eyestrain by trying to discern a piece of dark metal against an equally dark and oily background.

An increase of illumination may afford little if any improvement— for the dark metal may still lack sufficient contrast with the ground.

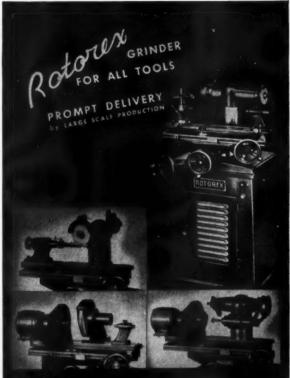
A simple coat of paint applied to the machine, however, may do the job perfectly. A black button on a

white card may be as visible under one foot-candle of light as a black button on a black card under a thousand foot-candles.

Illumination is not enough, for it lacks significance without contrast in color.

Birren notes that there are many strange inter-relations between ease of seeing and the functioning of the human body.

Where there is eyestrain, he says, physical reactions are to be noted in



DOUGLAS MACHINERY CO.

150 BROADWAY

NEW YORK, N. Y.

a generally nervous condition, increased muscular tension, more rapid blinking of the lids, decreased heart action, headache, nausea, fatigue.

Putting a slap-dash coating of white paint on the inside walls of a plant or office doesn't solve the problem of good illumination, according to Birren.

Too White
To build up illumination, brick walls
are painted white. Brick walls have
a reflectance factor of about 10; white
paint a reflectance factor of 80 or bet-



ALTERNATING CURRENT NOS. 184-186



Hardy, Rugged, throughout, from base to work rest.

Equipped with automatic starter having overload and undervoltage protection. Machine has push button control. Spindles accurately ground, and made of high carbon steel. Large sized ball bearings are mounted in heavy bell type end shields.

> Write for folder giving full details.

BRIDGEPORT SAFETY EMERY WHEEL CO.

1304 W. BROAD ST. INC. BRIDGEPORT, CONN.

ter. Why not paint everything white? But, if dingy walls are bad, the next

worst color is white-almost without exception. It is a law of vision that the eye is attracted by the lightest thing in its field of view, and for this reason light walls become a distraction.

d

m

m

p

d

a

N

H

n

to

e

n

d

r

c

f

b

n

L

c g

e

0

e

o

o

He warns that brightness is the chief thing to be watched, asserting there must not only be enough illumination to see clearly, but the object seen must be visible in its surrounding. Walls brighter than the details of the task cause eve strain.

Aircraft Handling Equipment

Just issued by Lyon-Raymond Corp., 165 Madison St., Greene, N. Y., Sec. No. 6, Catalog of Aircraft Production and Maintenance Equipment, should commend itself to those active in the field.

Illustrated with full details are spotting dollies, elevating cargo-body trailmechanical elevating portable cranes, elevating tables, open-end lift trucks and other apparatus specifically adapted to aircraft production and maintenance.

FOR REMOVING BROKEN TAPS Quickly-



Insert WALTON Tap Extractor and back out broken piece. No annealing - no drilling.

Easily-

Tap Extractor and Tap Wrench are only tools needed.

Safely-

Threads damaged. Not necessary to tap oversize after broken tap is removed.

> Folder 131 stres complete details.

95 ALLYN STREET. HARTFORD, CONN.

New Magnaflux Methods

Methods of detecting significant discontinuities in magnetic and nonmagnetic metal parts, by fluorescent indications under "Black Light," are announced in 2 new bulletins by Magnaflux Corp., 4 9 0 8 Northwest Hwy., Chicago.

Magnaglo, the method applicable to magnetic metals extends the Magnaflux method by development of ferro - magnetic particles which are fluorescent, glowing brilliantly in darkness, under Black Light. Advantages claimed for Magnaglo lie in (1) Greater contrasts on surfaces dark in color or unevenly lighted, on which black or red indications of regular Magnapowders or flux pastes afford low contrasts. (2) Obscured surfaces, inof tubes. springs, borings, etc., where Magnaflux indications

cannot be clearly lighted or viewed straightway.

In many applications, high contrasts afforded by the new method, increase value of Magnaflux inspections, says the firm, by (1) Greater sensitivity—showing up patterns so small they would be missed by other methods. (2) Greater speed in making all indications easier to find and interpret quickly; and (3) greater scope, making inspection independent of light-sources un-



GITS BROS. MFG. CO.

30 years of vil cup experience

d able to reach shadowed surfaces.

The Zyglo method, applicable to non magnetic metal parts, produces markings, primarily, by penetration of a highly fluorescent liquid thru the minute surface-openings to some depth within the inspected part. Subjected to Black Light, fluorescent markings coincide with discontinuities at surface in manner permitting ready interpretation according to cause. By knowledge of type, size and depth of flaws,

Remember

KANTI-LEVER COUPLINGS

Keep your Productive Machines out of the Repair Shop

Shutting down a productive machine for repairs is a serious thing todaywhy run this risk when the KANTI-LEVER COUPLING will enable you to avoid it? The KANTI-LEVER not only protects you against the evils of shaft misalignment like the ordinary Coupling, but it injects a resiliency into the driving torque of your Motors that absorbs the reoccuring load shocks and the torsional vibration that are the main causes of wear, fatigue and final failure of all types of machinery. See the cut below showing 70 KANTI-LEVERS that have run continuously for over 18 years and paid back their cost many times by rendering uninterrupted operation and greatly reducing repairs

Send for Bulletin 28-B describing

Kanti-lever Couplings



BROWN READING PA

related to intended use of parts, rejections can be made at earliest stages of production.

Claiming that heretofore no rapid, conclusive, non-destructive means of accurate, speedy inspection of non-magnetic materials was available, the firm attributes advantages of Zyglo method to factors:—(1) Increased sensitivity in location of underlying defects, only minutely open to the surface. (2) Speed and time-saving in scanning operations. (3) Absence of confusing highlights.

Zyglo, says the company, may also be used to supplement Magnaflux for inspection of magnetizable parts.

Full details of the 2 new developments are given in the bulletins.

Lucite Eve Aids

To insure accurate cutting of tapered metal parts turned on a lathe and boost production yields for military equipment, one company has installed a magnifying lens of "Lucite" methyl methacrylate resin on the taper attachment of its lathes.

The lens of "Lucite" magnifies the graduations and assists the operator in cutting tapers to within .0001" or less.

This lens, which also keeps out grease and dirt and reduces breakage and replacement costs over the material previously used, is made for Monarch Machine Tool Co., Sidney, Ohio, from "Lucite" produced by the plastics department of the Du Pont Co.

Metal is replaced and practical advantages offered by a one-piece oil viewer and filler cap molded also of "Lucite" for the latest line of McCormick-Deering cream separators.

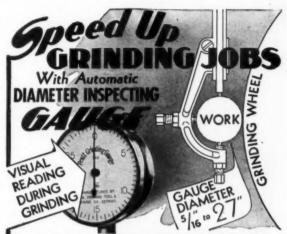
The transparent plastic part allows operator to see at a glance when oil should be added to lubricate mechanism of the separator. One-piece construction eliminates assembly of glass and metal and possibility of leakage. "Lucite" is corrosion-resistant and virtually unbreakable.

The part is molded for International Harvester Company by Chicago Molded Products Corporation from "Lucite" produced by Du Pont Co.

Electronics

Electronics is a new science for the new world, and the bright promise for the future, General Electric Co. points out in its July quarterly report to stockholders.

Human beings. says the report, like to dwell on the great "acci-dents" of science which have served as founda tion stones for achievement. others Among they list Newton's apple. Galvani's twitching frog legs the destruccaused lightning in Steinmetz' cabin on the Mohawk. Acci-Not realdents? ly. Rather call them legitimate by - products in t h e unending search for new knowledge. Call them unsuspected doorways to sci-entific study. The whole research structure, and the trained men had to exist, of course, before the "accidents" could happen.



Pratt Grinding Gauges caliper external cylindrical jobs while work is in motion or at rest. Adapted to straight or tapered work. Tolerances of .0001" plus or minus easily maintained. Visible check on out of roundness, rough grinding and chatter. Cannot grind work undersize unknowingly. Easily installed on any grinder. Pratt Grinding Gauges increase production, eliminate scrap and assure accuracy. A modern precision tool, ruggedly built.

DIAMOND TOOL & GAUGE CO. 15920 WOODINGHAM - DETROIT, MICH.

Perhaps the greatest "accident" of all was the Edison Effect. It came about in 1883, when Edison observed a bothersome phenomenon in some of his lamps when they were first lighted. It was a glow between the filament terminals, accompanied by a rapid disintegration of the filament. Investigating, he found the glow was due to current passing between the terminals, and

that a better exhaust eliminated the glow. There Edison—and the rest of the world—paused for several years, unimpressed by the fact that the phenomena of electronics had been recorded for the first time. The "glow" was actually an electronic gaseous discharge. It remained for Thomson, Fleming and DeForest, Langmuir, Richardson and Hull to build that ac-



IF CLOSER TOLERANCE IS NEEDED --YOU CAN GET IT

SMITH MASTER SURFACE PLATES

are processed to high standards of tolerance; but if you need closer tolerance, you can get it. Exclusive in design. These Surface Plates give you ample rigidity and stiffness with maximum freedom from distortion and minimum deflection. Each plate is a Marter Plate which meets were seen examination. With face your every specification. Write for descriptive literature today,

SMITH TOOL WORKS, INC., Ducyrus, Ohio

AVAILABLE SIZES

8" x 12" 9" x 14"

18" x 18" 18" x 24" 24" x 24" 24" x 36" 30" x 60" Otherswithin

this range

cident into a whole new science. Today we say Electronics is the new science for the new world, the bright promise for the future!

What Is Electronics?

What is electronics? It is the science of the electron. The world of substance is built of molecules. Molecules, in turn, are various combinations of atoms, or elements. Continuing this simplified, but fundamentally accurate explanation of the structure of matter. it might be said that atoms consist of a nucleus of neutrons and protons, around which negatively charged electrons whirl as do the earth and other planets about the sun. Thru the medium of the vacuum tube it is possible to separate these electrons from the atoms and put them in work.

In Edison's lamp, negative electrons, rushing from the hot filament, had no place to go until he sealed a wire, or anode, inside the loop between the two legs of the filament, and sent the electron flow, or current, from filament to "plate," or—in electrical language from cathode to anode. The rest is one of those fascinating, painstaking, sci-entific stories which rightly has no ending but only new chapters. In the first application of the Edison Effect. Professor Fleming developed a detector for wireless telegraphy, called the "Fleming Valve." Lee DeForest followed with the vacuum-tube grid, a small charged wire screen to control the flow of electrons thru the valve. Armstrong found how to use DeForest's discovery to amplify radio - frequency waves, and thereby put an end to the earphone era. Langmuir designed a high-vacuum tube which would handle watts and kilowatts, instead of merely fractions of a watt, and which could amplify the impulse of a microphone to tremendous power for radiation from an antenna. This was another key, to an even larger development-that of radiobroadcasting.

For this generation radio is still an amazing and unbelievable thing, even tho it has become as familiar and commonplace as plumbing and the automobile.

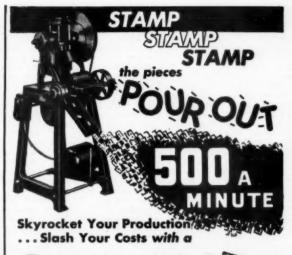
Dermatitis

Increasing interest in causes of
and cures for dermatitis is occasioned largely because of the great
number of men
and women called
into manual industry for the
first time by an
all-out war program.

Many of the newcomers do not understand fully t h e underlying causes of and prevention of the disease. Long experience has made possible a common sense approach to the problem, which is summed up briefly in a report by the research staff of E. F. Hough-ton & Co., Philadelphia, Pa. Dermatitis is the term used to describe inflamation of the skin. In industrial dermatitis the inflamation takes the form of acne, pimples or boils. usually on the hands or forearms, sometimes

on the face and the front of the thighs. The most common form is known as folliculitis, or inflamation of the follicles.

There is a general belief that folliculitis and boils are caused by bacteria in cutting oils. This is seldom the case, for usually both are the result of secondary infection of irritated or broken skin by bacteria normally found on the skin. The United States Public Health Service has examined many samples of cutting oil used by workers suffering from these disorders,



DIEBEL HIMSpeed PRESS

Absolute safety for men or women operators—controlled high speeds—automatic operation—these and other exclusive Diebel Press features add up to highest stamping production, lowest operating costs. A vital necessity today.



WRITE FOR BULLETIN . .

DI MACHINE CORP.

DIVISION OF DIEBEL DIE & MFG. CO.

3650 N. LINCOLN AVE. CHICAGO

but found that no significant number were contaminated with pus-bearing bacteria.

Nor is dermatitis in general a condition peculiar to the action of cutting oils. Insoluble cutting oils as a class are not adapted to bacterial growth because they contain such a large percentage of petroleum and because many of them embody antiseptic properties. Very few well-refined oils contain irritating ingredients.

Many non - occupational causes of dermatitis, such as poison-ivy, strong soaps, solvents or other compounds used to clean the hands, often are wrongly attributed to cutting oils. In such cases it is true that the inflammation may be aggravated or prevented from healing if exposed to cutting oil, but the cutting oil is not the basic cause of the inflammation.

Dermatitis in its various forms, says the report is caused primarily by clogging of the pores by grease or dust, by neglected abrasions, friction or failure to observe simple rules of personal hygiene. Workers subject to any of these factors may develop dermatitis even though they never come in con-

tact with cutting oil.

Skin infections may appear in varying degrees, depending on condition of oil, extent of contact, special factors of allergy and personal hygiene practices. Those with heavy growths of hair are more apt to develop folliculitis than are others, and blondes with thin, soft skin are more susceptible to irritation than are workers of darker complexion and thicker skin.

Folliculitis also may result from the

tendency of oil to dissolve protective fats from the skin, leaving it dry, with subsequent cracking and chapping. But whether for this reason or because of clogged pores, a disturbance in the functioning of glands ensues, resistance is lowered and infection sets in.

Other factors contributing to development of skin conditions favoring an outbreak of folliculitis or other forms of dermatitis include washing in kerosene or gasoline, or with sand soaps or soaps containing a high percentage of alkali. Only the toughest hides can withstand such harsh measures. In the majority of cases use of such cleaners dries out, cracks and chaps the skin, leaving almost perfect conditions for entrance of germs and development of infection.

If oil becomes germ-bearing it is frequently because of contamination by spitting or the depositing of organic impurities such as food refuse in the oil pans, and in some cases by certain types of water used in the soluble oil solution, such as water high in magnesium sulphate content, favorable to

bacterial growth.

If oil definitely becomes acid or alkaline in reaction, caustic or acid irritation may result. Under such conditions skin may become red fissured and sore, or even more seriously affected, depending on degree of irritation produced. After being used, cutoils contain small particles of metal which may cause sions and irritations. Use of wiping cloths containing minute splinters of steel puncture the skin surface and leave it open to infection. All of these conditions favor development of dermatitis in some form.

A small percentage of workers may be hypersensitive or allergic to certain ingredients in cutting oils, such as animal or vegetable oils, inhibitors or disinfectants. This condition is characterized by an eczematous type of inflamation, usually involving parts of the body encountering the oil directly.

Therefore says the report it is evident that with the exception of the allergic dermatitis, industrial dermatitis is primarily due to errors in personal or plant hygiene. The trouble is eliminated when the errors are corrected.



ENSIGN 371 BELT PRESERVER cleans all kinds of belts.
Removes gum and dict accumulations. Destroys glass
and stops slippage.

371 penetrates and increases tonsile strength of leather and pursus belts. Establishes even tension of V Belts on the Driven Pulley. Waterproofs and fume proofs, prevents belt drying out and establishes natural flexibility. Special treatment for special conditions.





United States

Belt Drive . . . Single Spindle

BUFFER AND POLISHER

Model 100

8º, 12º or 17º Spindles

RELT changed for speeds by removing one spindle and housing. Motor and pulleys easily accessible for adjustment. Spindle lock for holding spindle while changing wheels. Motor-in-base ball-bearing, mounted on hinged platform with adjusting screw on outside, heavy-duty, continuous service. Chrome-manganese one-piece shaft supported by four heavy duty ball bearings.

Write for details



MOTOR-IN-BASE

spindle affords maximum handling of large pieces.

THE UNITED STATES

ELECTRICAL TOOL CO.

CINCINNATI,

OHIO . U.S.A.



Welders

Floor models 10 to 35 KVA.

6 point selective switch on all floor models allows for quality welds on various materials. Standard and Underwriters Labeled Machines.

3 point switch on bench models.

Bench models 21/2 to 10 KVA_with or without pedestal.





Dyer Welders are available in a wide range of sizes and capacities—air, motor or foot operated, giving maximum production simplicity of operation-power economy.

300-322 Jackson St. THE TOPEKA FOUNDRY & IRON WORKS CO.,

Topeka.



DYKEM STEEL BLUE STOPS LOSSES making dies & templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

THE DYKEM COMPANY 2301G N. 11th St., St. Louis, Mo.

(In Canada: 444 Pacific Ave., Toronto, Out.)



Apprentice Training Aids

South Bend Lathe Works, South

South Bend Lathe Works, South Bend, Ind., offers these helps for the training of apprentices:

LATHE OPERATION—"How to Run a Lathe" is a well prepared 128-page book (Form LB-41) on operation and care of metal working lathes. Widely used for training apprentices and students and as a handy reference book for lathe operators. Covers such subjects as grinding cutter bits, turning, facing, drilling, and these dettire. reaming, tapping, and thread cutting.

LATHE OPERATION MOVIES—Two new 16 mm sound films in color, "The Lathe," and "Plain Turning," are available on a free loan basis for apprentice training in industries. They show what a lathe is for, how to operate it, and the performance of basic lathe operations. Showing time for both, approximately minutes.

THREAD CUTTING "How to Cut Screw THREAD CUTTING" is a 25-page booklet (No. 36A) which includes such information as setting a lathe for cutting various pitches of screw threads; setting cutter bits; formulae; multiple threads; metric threads, etc.

GRINDING CUTTER BITS—An informative 12-page booklet (No. 35) on grinding lathe tool cutter bits. Covers identification and application of the various cutter bits; methods of grinding; correct angles for grinding the various types of tools and for machining various materials. Price 10c.

SHOP WALL CHARTS—A complete series of

40 wall charts and blueprints of value to lathe operators and machinists. These charts cover such subjects as drill sizes, pitch di-ameters of screws, standard fit tolerances,

connectes of screws, standard fit tolerances, correct use of calipers, application of lathe tools, etc. Circular PBL listing these blueprints and charts is available.

PROJECT BOOK—"The South Bend Machine Shop Course Sook" (39M), contains 12 practical projects for lathe apprentice training courses. It acquaints the learner with the basic metal turning operations thru a carefully planned and graded set of projects. Complete assembly and detail drawings of arch project with all lathe and bench opera-

Complete assembly and detail drawings of each project with all lathe and bench operations outlined in correct sequence. Price 50c. Sample copies of all these books will be sent free of charge to shop superintendents and apprentice supervisors by South Bend Lathe Works, South Bend, Ind.

NEW LOW COST DRILL GRINDER

Anyone can do expert drill grinding with this simpleto-use drill grinding attachment—fits on any beach grinder—saves buying new twist drills—saves time



that dull bits waste. Grinds bits from 3/16 to 11/4. Write for FREE literature.

Cansas City. R

Cograph Colloid Graphite

Nassau Laboratories, Hackensack, N. J., offers a new folder on natural coloidal graphite, copies of which are available to those interested in lubrication. The company's product, Cograph, made in several grades, is a natural graphite of great fineness for suspension in the thin lubricants and liquid fuels. The microscopic particles are said to form a skin overbearing on shaft surfaces, preventing wear, overheating, rust, carbon formations, etc.

Acme Steel Strapping

Protection to shipments of war products including ammunition carriers, crated warplanes, food, lumber, chemicals, gun turrets, etc. are featured in the current issue of Acme Process News No. 7. This well illustrated 12 page house organ should be helpful to all manufacturers and shippers handling war contracts.

Copies of this and succeeding numbers are available from Acme Steel Co., 2821 Archer Av., Chicago.

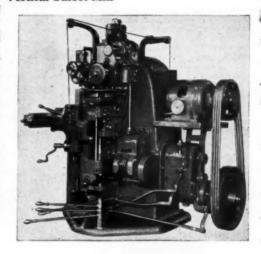


Vertical Turret Mill

Convenient handling of work, quick, easy chucking, minimum setup time, fast traverse, foot-operated control and specially designed swivel head, features of its vertical turret mills stressed by Rogers Machine Works, 135 Arthur St., Buffalo, N. Y., are impressively illustrated and detailed in a new bulletin No. 103, available from the company.

An excellent "close-up" of the machine is given in a 16x17" plate, while other illustrations, charts and drawings leave nothing wanting in the way of full details, inclusive of a list of prominent war-production users of the product.

Ability to make quick deliveries is announced.







Vimeolight helps reduce spoilage . . . increase production. Covel Manufacturing Co. use these non-glare lights as standard equipment on certain models. Are YOU enjoying their advantages?

VIMCOLIGHT



Reduce Blade Breakage Increase Production

Easily adjusted to all sizes of blades to 11/2" wide.

Recommended for new and old machines running at any speed cutting all materials.

Shipped on 10 day approval

PADDOCK TOOL CO. 1418 Walnut St., Kansas City, Mo.

COATINGS for DRAWING STAINLESS LOW & HIGH CARBON AND COPPER COATED WIRE



"Gilron" Compounds increase drawing of

considerably.

Can draw up to six reductions without re-coating.

> **Better Lcoking Finish** No Scratching Longer Die Life.

Please write to us for full particulars

Gilron Products Co., Inc. 1557 East 40th Street . Cleveland, Ohio

BALANCING WAYS

If you handle rotating parts in your shop, consider this simple, sturdy and thoroughly dependable device for balancing, straightening and truing operations. It assures better work in less time and with less labor.

Four chilled iron discs rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.

Write for complete details.

ANDERSON BROS. MFG. 1917 KISHWAUKEE ST., ROCKFORD, ILL.



Swing	Greatest Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000

Output Goes UP Costs Go DOWN ... with

NICHOLSON EXPANDING MANDRELS

ECONOMY TOOLS . . . for holding work while being machined between centers on lathes, grinders, millers, shapers, etc. Hardened tool steel, accurately ground. Sold singly or in sets. Write for bulletin.

All Sizes (Up to 71) in Stock for IMMEDIATE DELIVERY

(Prices Subject to Change)

TYPE A-STEP JAW DESIGN

Size No.	Range o	Not Price		
1A	1/2"	to	1"	\$12.00
2A	I"	to	11/2"	16.00
3A	11/2"	to	2"	23.00
4A	2"	to	3"	34.00
5A	3"	to	4"	40.00



TYPE B-STRAIGHT JAW DESIGN

Size No.	Range of Bores Taken	Net Price
1X	1/2" to 9/16"	\$10.00
2X	9/16" to 21/32"	11.00
3X	21/32" to 34"	12.00
00	34" to %"	14.00
0	%" to 1"	16.00
1	1" to 11/4"	18.00
2	11/4" to 1-9/16"	21.00
3	1-9/16" to 2"	29.00
4	2" 40 216"	40.00

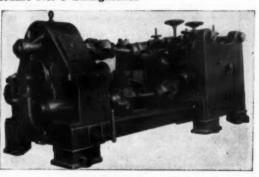
W. H. NICHOLSON & CO., 117 OREGON ST., WILKES-BARRE, PA.

Medart No. 3 Straightener

Medart announces a complete line of 2 roll. Standard Bar and Tube Straightening, Sizing and Polishing Machines. including 8 sizes ranging from a bar and tube capacity of 1/16" to 9" diameters.

Recent improvements are said to have increased speed and facility of operation. Wider angularity of roll adjustment now possible gives a greater variation in work operations, ranging from adjustments for high speed

straightening to more exacting operations of sizing and polishing on all types and conditions of bars. Universal joints are now Timken Bearing equipped. Rolls are of highest grade Smavroc forged tool steel, properly heat treated, tempered and highly polished. Concave roll is of patented Medart



design. The features of "continuous, end-to-end feeding" and "instant reversal of workpiece direction" have been retained in these newer models.

These machines are now said to be doing yeoman service in many war plants on entirely new types of appli-

SIMPLIFIED INTERNAL GRINDING the with MAJESTIC INTERNAL GRINDER



An exceptionally wide range of internal grinding jobs can be handled on the New Majestic Internal Grinder. Its simplicity of design and ease of operation are features of utmost importance in providing maximum grinding output at low cost.

SPECIFICATIONS

Length of table, 48°. Swing over table, 10°. Travel of cross slide, 2½°. Precision disl graduated to .0001°. Precision bearing work head. Speeds—100, 225, 350 r.p.m.

Write for complete details contained in New Bulletin

Majestic Tool & Mfg. Co.
2948 E. Woodbridge Detroit, Mich.

The HARTFORD SUPER SPACER

The Super Spacer, with its attachments and fixtures, has proven to be a tool of exceptional value for the rigid control of accurate machining op-

erations. It is adaptable for Milling, Drilling, Grinding, Jig Boring and Slotting, at feeds and speeds limited only by the capacity of the holding means and the power of the machine.

Write for detailed information.

THE HARTFORD SPECIAL MACHINERY CO.

4/42

cations. Medart engineers are ready to adapt them to a variety of specific requirements.

They are made by The Medart Co., Potomac and De Kalb Sts., St. Louis, Mo.

7th Column

Dramatizing urgent need for reduction of countless accidents that are robbing America of vital manpower in war industries, Liberty Mutual Insurance Co., Boston has launched a striking campaign to smash the "7th Column."

The "7th Column" is carelessness, and it robs our nation of more manhours than the saboteurs of the 5th column and the rumor-mongers of the 6th column, says Bennett-Moore, vice-president of Liberty Mutual.

In announcing the plan, Moore pointed out that work accidents cost American industry 180 million man-days in 1941. Accidents due to carelessness kill 102,500 Americans each year and injure 9 million others, he said. This high accident rate must come down, and Liberty Mutual plans to devote all its normal peace-time sales promotional and advertising budgets, plus substantial increases, to "smashing the 7th Column"—in war plants and in the homes and on the highways thruout the nation.

Thousands of posters will be placed in industrial plants to remind all warworkers of the menace of carelessness.

Mr. Moore said the advertisement will offer a booklet on h.w to "Smash the 7th Column" and also a series of gummed stickers to be used at danger points in plants and homes. These stickers carry safety instructions and warnings. Like the nation-wide campaign already underway to reduce accidents by the WPF to conserve manpower, launched by President Roosevelt Liberty Mutuals campaign is designed to bring the urgent need for safety programs dramatically to the attention of all Americans.





Actuation

One of the biggest words in the vocabulary of the machine designer. so far as importance is concerned, is "actuation." A given motion, of major or minor importance, is desired on a certain machine element or part. How will it be actuated? Electrically? There are plenty of electrical specialists, who are prepared to collaborate in the application of individual electric motors. automatically cut into and out of service, as the need may appear, or to help in obtaining certain motions electromag netically.

Shall we actuate it hydraulically? Hydraulic motors or hydraulic cylinders, made by specialists on this angle of the actuation field, await your pleasure, and there are few motions that cannot somehow whe derived from them, together with as much or as

little power as may be desired.

Compressed air may be the best solution to your particular problem. More things are being done pneumatically as the days speed on. Whether you want to reciprocate the pads of a rubbing machine, hoist materials, or open and close a hot furnace door, the pneumatic cylinder may be put on the job. So far as the mechanics of the thing is concerned, a cylinder is the same type of device, whether operated by liquid, by air, or by steam.

NO. 1 HEAVY DUTY GEARED HEAD MILLER

Available with Longitudinal Power Feed or Hand Feed to Table



Table: 6"x24"
Capacity 51/2"x81/2"x18"

Geared Spindle Speeds 6 forsward, 6 reverse. Optional spindle speed ranges available. 150-675 r. p. m.; 200-900 r. p. m.; 350-1350 r. p. m.

Anti-friction speed and spindle assemblies.

Built in coolant pump and piping. Motor in base.

> PROMPT DELIVERIES

ATLANTIC MACHINERY CORP.

149 BROADWAY.

NEW YORK, N. Y.

There are of course endless considerations that are purely mechanical. You may use a lever or a system of levers; a cam or a number of cams, a pair of gears or a train of gears.

The chief consideration is not merely to find a way to do it. Any man can do that. The problem is to find the best way to do it. Such procedure saves the need of making changes at some future time . . . changes which, if involving duplication of work, are usually all the more costly.

Relubricating Bearings for Low Temperatures



A new low temperature relubrication service for aircraft antifriction bearings is announced by Pacific Railway Equipment Co., Los Angeles, Cal.

SCRAP — ? Recover it with the TORNADO



Portable Industrial Vacuum Cleaner

QUICKLY picks up chips, dust or water. Cleans walls, beams, machines, floors, boiler tubes and tops, molds, etc. Powerful-portable. A real cneman unit. Weighs only 40 lbs. Dirt capacity, 12 gallons.



Write for details and FREE TRIAL OFFER

BREUER
Electric Mfg. Co.
5118 N. Ravenswood Ave., Chicago, Bl.

TORNADO



A simplified, precision tool for milling, boring, facing and routing small parts for instruments and arms, munitions, etc.

Spindle dia. at driving end, %*, 1150 and 1750 r.p. m., 5 Speeds. 12* longitudinal travel of table, 7* cross travel, 4* Spindle feed.

WRITE FOR FOLDER

AG&S Representative in all principal cities.



GRANITE STATE MACHINERY CO.

Exclusive Agents
H. LEACH MACHINERY CO., Providence, R. I

DESMOND GRINDING WHEEL DRESSERS and CUTTERS



We can supply you with the proper Dressers and Cutters for all of your grinding wheels.

Ask for copy of our catalog and name of your nearest dealer.

SIMPLEX

Steel Slide



A full line of Machinists' Filers, Welders, Production and Drill Press and Milling Machine Vises.

Let us send you our vise catalog and name of your nearest dealer.

The DESMOND-STEPHAN MFG. CO., Urbana, Ohio

BRADY-PENROD MODEL 600

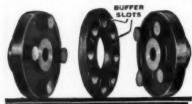
Durablel This pump stands up under hard use. Hydraulic efficiency as high as 70%. Quickly installed by any shop man at little cost and easily moved from one job to another. Controlled flow— 60 g.p.h. with 3% tubing to 1200 g.p.h. with 1% pump. 18 H.P. Tank With Built-in Buffle. 12" x 12" heavy galvanized sheet iron with baffle separator to collect heavy chips. Painted machinery feturn piping.

BRADY-PENROD, INC., Muncle, Indiana, U.S.A.









The BUFFER-SLOT COUPLING lengthens the life of your Motor-Driven Machines by absorbing the load shock and constant vibration that gradually wear out machinery and bring on shutdowns and repairs.

UFFER-SLOT COUPLING

It not only gives you all the advantages of the ordinary Flexible Coupling but it goes a step further and restores that cushind driving torque lost when you discard-ed Belt Drives. It is long lived, depend-able and especially adapted for use with machinery having Ball or Babbitt Bearings.

SEND FOR BULLETIN No. 24-B

126 N. THIRD ST. ROWN ENGINEERING CO. READING DA



Designed to help the relubrication of the millions of aircraft bearings tagged by the Army to be relubricated for low temperature operation, this new high speed service is being used by major aircraft companies thruout the U.S.

Emergency rush orders all receive special attention and are processed and shipped at once.

All bearings are degreased, washed clean, dried, marked for identification, relubricated with an approved low temperature lubricant, and carefully packaged for shipment, all under Army supervision.



New accessory unit for use with Profilemeters, developed by Physicists Research Co., 343 S. Main St., Ann Arbor, Mich. Known as a "Power Pack" it permits use of Profilemeters on a-c lines.



Air

d

h

r

d

d

v

N a

Air in various roles stands forth in relief today as a valuable servant of industry. A mere blast of air has been found useful in many ways. Useful for cleaning machines. motors. drawers and hins. Useful in connection with a kerosene gun for cleaning away sludge and caked formations. Useful in the sand blast now so widely applied to in-dustrial problems. Useful for cooling hot dies, and for other cooling purposes. Useful for ejecting scrap from trimming dies. The air blast is interesting an study.

Application of compressed a ir for operation of lathe chucks, milling machine vises and any number of other work - holding devices in metal

working industries is one of the most interesting to be found. In many places where steam cylinders were formerly used on various types of equipment, and where the heat incidental to the operation of steam cylinders made certain jobs hard on operators, the air cylinder has been substituted to high advantage. Take the piston of an air cylinder and attach it to a toggle linkage, to a lever or other mechanism, and you have the necessary moving element for operating various mech-

New LYON Hydraulic-Lift

It's interchangeable in a Flash to a

- Stacking Truck
- Boom Truck
- Die Handler
- Die Separator

 Ind-new Cantilever-type

This brand-new Cantilever-type Lyon Hydraulic is easily adaption able to a wide variety of uses. It's designed to make the shift from lifting and stacking to crane work and die-separating in a matter of seconds. The removable platform and boom, so quickly interchangeable, make this remarkable Lyon unit a highly profit-



 With platform alone . . . for qui stacking of materials.

able piece of equipment for fast, efficient material handling.

It's a sturdy and strong truck, with capacity of 1000 lbs. and up, yet it's easily maneuverable, light and simply operated. The Lyon floor-lock gives it a safe, secure anchorage. And there's power to spare in the Lyon Hydraulic two-speed pump.

Write us today for full information, specifications and prices.





LYON-Raymond Corporation

Formerly Lyon Iron Works . . . Established 1840 175 Madison Street Greene, New York

anisms by remote control. It is simply a matter of installing the right type of air valve at the right place.

The number of efficient portable tools that are now powered by compressed air is great, and the shop that is not equipped with a good air compressor is badly handicapped in a number of ways. In the finishing room, where inflammable materials are handled and sprayèd, air operation of rubbing tools is considered safer than electrical operation.

Ten-Point Thread Cutter

Attachable to any screw cutting engine lathe, and taking the place of single point thread tools and chasers commonly used, the Rivett Improved Thread Tool is designed to overcome many of the disadvantages of single point tool thread-cutting.

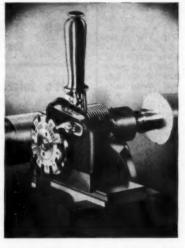
The device, made by Rivett Lathe & Grinder, Inc., Brighton, Boston,



tear on the driving units.

DEALERS IN PRINCIPAL CITIES CARRY STOCKS FOR IMMEDIATE SHIPMENT.

FLEXOID COUPLING CO., Div. THE SMITH POWER TRANSMISSION CO. 1545 E. 23rd Street Cleveland, Oh.



Mass., is a holder for a 10-tooth cutter, with means of indexing to present each of the 10 teeth successively to the work, with adjustments for controlling finished thread. Cutter is a disc of high grade tool steel, with 10 teeth. Each tooth has a prescribed increase in radial length, affording, in effect, 10 cutting tools. The first 9 teeth rough out thread in 9, progressive, heavy measured cuts. The 10th finishes the cut.

Use of the tool is said to save time on all threading done on engine lathes, especially where a number of duplicate



QUADRO PRECISION LIVE CENTERS

5 REASONS Why They Meet Every Specification:

FOUR (4) ROWS of precision BEC-4 specification bearings. Note SHORT OVERHANG assuring rigidity and accuracy... eliminates "chatter"

Positive FELT-SEAL—excludes dirt—retains lubrication.
HARDENED AND GROUND CONE—point securate to within

	Tops No.	A	3	c	D	E	Radial-Threst Load Ac 100 R.P.M.	No. Price
	2	1%	36	*	146	2%	3600	\$23.00
	3	1%	76	*	Pla	3%a	3300	\$25.00
	4	216a	1964	1950	1%	4%a	7500	\$35.00
	5	2%a	1%s	1	25ía	5%s	12000	847.00
,		_		AI	1			

Combined Ra-Thrust

	9	
(00 00	
6		-

ccompanied by extendable priority

FISHER TOOL

226 LAFAYETTE STREET NEW YORK CITY



o

n

BUY

For metal cutting results that satisfy. There is a LENOX Distributor near you.

AMERICAN SAW & MFG. CO. SPRINGFIELD, MASS



"The Blade in the Plaid Box"

threads are to be cut. Such is the efficiency claimed that many threads formerly cut with dies, because of high cost of single-point threading, can now be cut on engine lathes with assured accuracy and concentricity.

Further advantages claimed for the device besides speed are:—time saved in grinding, cutter never needing grinding on sides, requires sharpening about 1/100 as often as single point tools; permits time needed to cut a lot of screws to be accurately calculated from lathe-speed and number of threads . . . 10 traverses complete the thread; greater accuracy; non-chattering; uniformity of production and longer cutter life.

Probably one of the most valuable factors, however is that operations are so simple, they can be performed by unskilled employees, a significant asset to the war effort.

Forms are available for representative types of threads, with pitches to 6 threads per inch. Frayco Motor Data

Frayco Motors are available in 1/3, ½, ¾, 1, 2, 3, 5, and 7½ hp ratings, with standard NEMA dimensions and shaft sizes.

Standard frame mountings are of Meehanite, normalized for permanent laignment. In addition to standard plain and flange type mountings, motors are available with special end bell designs to meet individual requirements of machine designers.

These motors are said to have a simple, rugged design for long service under severe operating conditions. Rotor windings are cast integral with rotor laminations. In the laminations, special electrical steel increases efficiency and overload protection. All laminations are welded together to increase rigidity and resistance to vibration. Oversize rotor shafts are further assurance of rigidity.

Rotors are mounted in lifetime lubricated ball bearings and are statically and dynamically balanced. All parts are machined to close tolerances for interchangeability.



Shut Off Expense Caused by Slippage You Save Money on Every Installation

NEW LOW PRICED PRODUCTION LINE SOME OF SIZES Send for List—On the Shelf

Increase your Production

We supply Fractional Dia. and Face Palleys—From large casting steck.

VACUUM CUP METAL PULLEY CO., INC.,

12535 Grand River Ave.,

Detroit, Mich.,

Alignment

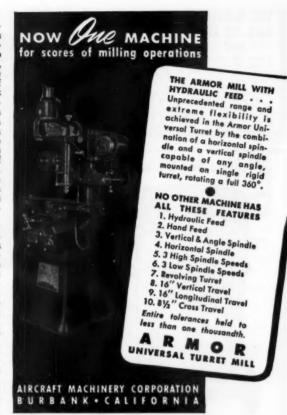
Here is a proposition which faces both machine designer and shop man continuously, for when machine parts get out of proper alignment the results are likely to be serious. In days gone by, if a machine settled a bit one way or the other, bearings were thrown out of alignment and trouble was at hand immediately. Often the cause of it was obscure and difficult to find.

Probably the development of antifriction bearings which will compensate for conditions of misalignment is one of the most important things in machine design, tho we seldom think about it as such. There are different self-aligning bear-ing layouts that have been developed. One involves a double outer raceway one part of which is concave and the other convex, so that one can tilt sidewise in the

other. In one roller bearing layout that has been noted, the regular inner and outer raceways are convex where they contact the rollers, and the rollers are turned out concave, or with their center diameter smaller than their center diameters.

their outer diameters.

Alignment is important in places where a tool approaches a hole previously drilled in a piece of work, but sometimes is difficult to obtain. Here, alignment of a sort is provided by the use of so-called floating toolholders



which compensate for any misalignment between the tool and the work. It is interesting to note that compensating features of these types may be introduced to keep things moving smoothly, when perfect alignment in its own right is practically impossible. They are valuable aids, especially in these days, when urgency of war-production places added value upon uninterrupted operation, calling for every ounce of ingenuity at the nation's command, to keep equipment at full efficiency.

THE HANDIEST

CREATEST CAPACITY SMALLEST FLOOR SPACE

4 arms, \$10 high, stacks 10,000 lbs.; 5 arms, \$70 high, 12,000 lbs. fist or round stock. Pips or tube, less weight. 3 stands for 201 lengths; 2 for 121 or shorter. Use against wall or back to back in center of room. Coet is small, value big-

Write for circular and prices.
Priority Regulations govern delivery.
WM. S. YOHE SUPPLY CO.
33 Nahoning Rd. N. E. Canton.



Welders for Defense



Any two Knock-Out welders can easily be connected in series to combine the amperage of both machines for occasional jobs requiring large capacity. Separated, they can be used on different jobs within their capacity.

Write or Wire for Bulletin W42-9H

K. O. LEE COMPANY Aberdeen, South Dakota

Infra-Red Drying of Prints



Production of Van Dykes was speeded up 350 per cent, and the number of rejected prints reduced from 25 per cent to zero, a saving of approximately \$300 per month, by infra-red drying lamp, according to J. J. Deller, supervisor of reproduction and blue print departments at the Westinghouse East Pittsburgh works.

The increased use of Van Dykes to

The increased use of Van Dykes to meet wartime production schedules resulted in a careful time study analysis of the printing process. Biggest time losses were found in print drying and in repeat jobs due to rejects from dis-

tortion.

In processing, the Van Dykes are kneaded in water and fixing baths, then hand-squeegeed on a steel roller and finally put thru an electrically heated dryer. Under the old method, drying time was 10 minutes, and the squeegeeing often distorted the drawings to such an extent that they had to be scrapped. This was particularly true of prints that had to be to scale.

Both fidelity reproduction and reduced drying time were attained by using a bank of 12-250-watt, infra-

ERRINGTON MECHANICAL LABORATORY

MAIN OFFICE AND WORKS: STATEN ISLAND, NEW YORK

Chicago Office: 5422 N. RICHMOND STREET New York Office: 200 BROADWAY Boston Office: 830 OLD SOUTH BLDG.



Style D-E, Quick Change Tools

A USEFUL ADDITION

Modern precision machine shops and inspection departments will find this sturdy 36°x 48° MILWAUKEE SURFACE PLATE a valuable addition. Constructed of semi-steel, accurately machined, securely mounted on cast legs which are machined and provided with SAE adjusting screws for perfect alignment. Height from floor to top of plate 30°. Can also be had in 38°. Shipping weight 1200 lbs.

We also manufacture angles and parallels as shown underneath

parallels as shown underneath surface plates either with planed or scraped surfaces, whichever is desired. Write today for full information.

J. C. BUSCH COMPANY ENGINEERS AND MACHINISTS

MILWAUKEE, WIS.

EKLIND

UNIVERSAL MILLING HEAD

CAN RE ADAPTED TO ANY MACHINE

MILLS DRILLS **BORES** at any

angle Speeds

from 250-4000 Write fur Circular



UNIVERSAL HIGH SPEED TOOL CO. 551 W. Washington Blvd. Chicago, III.

VARIABLE SPEED TRANSMISSION

For "A" section V-belts_3.3_1 speed range _ perfect belt align-ment in all positions. Priced so low that no shop or machine need go withoutinfinite speed selection. See your dealer or write \$16.50

(3 Types-8 sizes to choose from)

Standard Transmission Equipment Co. 3400 YERDUGO ROAD LOS ANGELES., CALIF.

red lamps in the drying cycle and then hand-squeegeed on a steel roller and drying unit. Van Dykes up to 102 by 36" are hung beneath lamps strung in 3 rows 9" apart. The 4 lamps in each row are spaced every 2 feet. Drying time for the average (24x36") size print is only 3 minutes instead of 10.



With the mounting volume of materials to be handled, and the steady shrinking to be handled, and the steady shrinking of man-power, increasing numbers of women are entering industry. Here is a modern type of truck built by Clark Tructractor Div. of Clark Equipment Co., Battle Creek, Mich., now available for gas ar electric power. The machine loads of from 2000 to 7000 lbs. Operator can tilt load back 10 degrees in 5 seconds for safe riding and 3 degrees for condisions of the condision of the condision of the condisions of the condisio onds for safe riding and 3 degrees forward in 1 second for tiering.

RIND-A WET GRINDING OPERATIONS

A CONCENTRATE — Immediately Miscible with your present Grinding Fluid.
Uses One Quart to 30 Gallons.

GIVES THAT FINISH YOU HAVE LONG DESIRED. Economical to use. SAVES TIME IN ELIMINATING SUCH FREQUENT SHUT-DOWNS FOR WHEEL DRESSINGS.

Order thru your Industrial or Mill Supply Jobber. If he does not stock or will not get Grind-All for you, send your order to our nearest plant.

STADOIL MANUFACTURING 817 S. Beacon St., Dallas, Texas 3221 S. Figueroa S COMPANY

3221 S. Figueroa St., Los Angeles, Calif.

"Unbelievable Production Savings with TRU-LINE Tools."

Say Hard-Boiled Production Men



For straight, profile or step dressing.

If you have a particularly tough job of wheel dressing and are unsatisfied with present results, we invite you to try a TRU-LINE TOOL engineered to your specific job.

The savings accomplished by TRU-LINE TOOLS, particularly in reducing machine down-time, are often described as "unbelievable"—and that means something when it comes from hard-boiled production men interested in nothing but results.

TRU-LINE TOOLS are made only by Wheel Trueing and are protected by patents covering four exclusive features.

Features of Exclusive, Patented TRU-LINE TOOLS

- NEW WAY
 Two ay meny diamonés C.
 Coring in the same bask
 Palating in the wheel same
 Palating in the wheel same
- * No changing, turning or re-setting.
- * Less down-time more production.
- * A free-cutting wheel with fewer passes
 —longer wheel life—longer dresser
 life.
- * Uniform wheel finish.
- * Uniform work finish.
- * Lower tool cost.

PRODUCTION MEN!

Send for Engineering Data Sheet and Folder describing TRU-LINE PRINCIPLE and GUARANTEED PERFORMANCE with TRU-LINE Engineered Tools.

WHEEL TRUEING TOOL COMPANY

3202 W. Davison

DETROIT

Established 1910

Buy a Share in America with War Savings Bonds and Stamps



Hobart Group Booklet

An unusually attractive new 20 page booklet, in patriotic colors, editorially and pictorially explains the products, manufacturing, engineering facilities, and war time activities of the Companies making up the Hobart Group of factories. Many application pictures show possible uses for Hobart products in war and peace time activities. Copies are available from Hobart Bros. Co., Troy, Ohio.

Ampco Aircraft Bulletin

"How Aircraft Designing Engineers Use Ampco Metal" is an 8-page, letterhead-size bulletin, being distributed by Ampco Metal. Inc., Milwaukee, Wis.

Ampco Metal, Inc., Milwaukee, Wis.
The booklet describes pictorially the
use of Ampco Metal by the aircraft industry. Printed in 2 colors, it is well
illustrated with photographs of a wide
variety of aircraft and equipment.

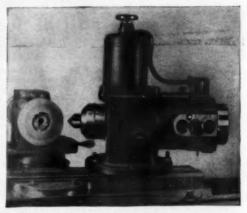
Copies of the new bulletin will be sent to interested engineers.

Deep Drill Hole Sharpening Attachment

Drills sharpened by this attachment, cut freely and make clean, accurate holes, easily and more rapidly, according to Circular 467, issued by Pratt & Whitney, W. Hartford, Conn. Designed to end haphazard, freehand grinding, it can be clamped to standard tables of universal cutter or other similar grinders.

The attachment was developed to sharpen single lip drills with straight or helical chip grooves of % to 2" inclusive diameter range. A model is also available for drills ranging in diameter

drills ranging in diameter from 3/16 to %". Selective cam action on the attachment makes it possible to keep accurately predetermined drill tip angles with clean, sharp cutting edges.



Developed, mainly for sharpening step drills, it sharpens with equal facility, V-shape drills and other cutting tools of similar shape.

TROYKE ROTARY TABLES



Sizes 9*, 12*, 15* and 18*.

Ask your dealer or write us for eight page catalog.

ALFRED A. TROYKE

4422 Appleton St., Cincinnati, O.

SCREWS IN STOCK FOR PROMPT

SHIPMENT

 Yes, sir... we deliver the goods! All standard sizes of Socket Head Cap Screws and Hollow Set Screws carried in stock for your convenience.

We can fill your requirements for all Die Maker's supplies, including a complete line of Springs in three standard types, Dowel Pins, Transfer Serews and the amazing Hardsteel Drills that enable you to drill hardened steel without amealing.





WRITE FOR ILLUSTRATED CATALOG

DIE SUPPLY CO.

R. Fitzsimmons W. H. Fitzsimmons Jos. T. Fitzsimmons 1755 Hough Ave CLEVELAND © Express 1133



Thousands of productimeters

record ALL-OUT PRODUCTION

Industry knows Productimeters! Years of research and engineering are behind their speed and precision construction... their dependability for accurate production control. Productimeters are prepared now to answer the call on our first line of defense... the production machines of America.

Write today for Catalog!

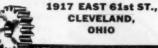
DURANT MANUFACTURING CO.

Geared For Victory

Gear Specialists

- SPUR
- · WORM
- . BEVEL
- · HELICAL

The Taylor Machine Co.



"TAYLOR - MADE"

* CONTOUR CUTTING with ATLANTIC

Band Saw Blades

speeds production

Atlantic Metal Cutting Band Saw Blades have been developed through twenty years of research and specialization.





Special Box Easy to Use SAW MFG. CO.

Metal Cutting Band Saws Exclusively

153 Brewery St., New Haven, Conn. SEND FOR FREE BOOKLET



"ALNOR" Velometer An All Purpose Air Velocity Meter Instantaneous.

Direct Reading.

Measures total and static pres-

sures as well as velocities. write for cutalog

ILLINOIS Testing Laboratories, Inc. 150 W. Habbard, Chicago Drill to be sharpened is located by kays in spindle, which is hollow, to accommodate drills with or without shanks, of any length. Cylindrical cam attached to rear of spindle has 3 different cam grooves. Selection of cam action is made by insertion of removable cam-roller into desired groove. A ½-¼ hp 2-speed motor drives the spindle which can also be rotated manually. Cam throws, standard, rise in:—180°, 3/16"; 144°, ¼"; 112.5°, 5/16". Wheels: diameters and holes, to suit Grinding Machine used. Width of face recommended, 1¼".

Shown mounted on Cincinnati Universal Cutter Grinder, with recommended setup for sharpening second step of a three-step drill tip. Cam roller stud is in second threaded hole.

"Super Sight"

Subject of a 4-page catalog just released by Boyer-Campbell Co., 6540 Antoine St., Detroit, Mich., is Super Sight. It shows how this product combines magnification and properly directed light and its adaptation to close inspection, fine assembly and precision machining. It is supplied with either 4" or 5" lenses and, besides standard models with various brackets for bench and machine, available with fluorescent, vaporproof lighting. A supplementary folder, describes the values of properly directed light, plus magnification, as adapted to first aid and hospital use.

STEEGE MOTOR DRIVES FOR DEFENSE GUARANTEED FOR FIVE YEARS

No chance of breakdown, doing a good job



good job powering machines for defense production. No noise, floating cone, results 100% power. 8 years of production

proof of durability. Easily installed.
PRICED AT \$40. AND UP. FOR LATHES,
SHAPERS, MILLERS, ETC. IMMEDIATE
DELIVERY. Send for descriptive pamphlet.

W. L. STEEGE MACHINERY CO. 100 So. Jefferson St., Chicago, III.

"KEEP 'EM ROLLING"



FOR DEFENSE

KARELSEN'S DIAMONDS KEEP THE WHEELS OF INDUSTRY TRUE

DIAMOND POINTED EMERY WHEEL DRESSERS

IMMEDIATE SHIPMENT

Send for Prices Specify Holder
"If its made of Diamond—Ask us First,"

E. KARELSEN, INC. 56 W. 45th St., New York, H. Y. Tel. VAIL 6-5688

SHEAR
IT
GLEVERLY
WITH
A
BEVERLY



BEVERLY Throatless BENCH TYPE SHEAR

BEVERLY CUTS ANY SHAPE - Faster!

Cuts straight—round or any irregular shape without distortion. Accurate too! Hundreds of applications on "A1A" contracts, in shippards, airplane factories and with our armed forces. Made in 3 sizes: No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 1/6 inch mild steel and 10 gauge stainless. Order today!

BEVERLY SHEAR CO., 3005 W. 110th Place, Chicago, Illinois

Ulmond Orill Chuck



The Original Manufacturers of Drill Chucks!

The Almond Three-Jaw Drill Chucks were the first to be placed on the market. They were Pioneers in the field of Drill Chucks. For over Seventy Years Almond Chucks have formed a necessary part in the logical procedure of Machine Developments. Are made in types and sizes to fit all Machine Tools and Portable Drills.

Write for further information.

T. R. ALMOND
MANUFACTURING COMPANY

ASHBURNHAM.

MASS., U.S.A.

WRITE FOR FOLDER



Minnespolis Office
H. A. HOLDEN CO.
300 4th AVE., So. Minneapolis, Minn.

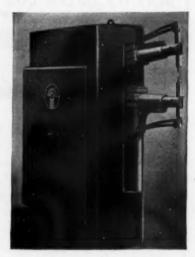
CATALOG ON REQUEST

Progressive Rocker Arm Welder

A line of rocker-arm welding machines, available in 48 models is announced by Progressive Welder Co., 3050 E. Outer Drive, Detroit.

The new stream-lined welders are available in 4 capacities with 3 types of drive and a full range of throat depths from 12 to 36". Standard capacities are 20, 30, 40 and 50 KVA, and 50/60 cycle supply with other frequencies available at slightly higher cost.

To meet a wide range of requirements these machines are available for foot, air or motor operation. In the lowest-cost foot operated type, pressure to bring electrodes together is obtained thru pressure on a pedal connected to rocker arm by a system of mechanical links. A limit switch to initiate operation of contactor at proper pressure, is mounted on overtravel spring.



A single acting cylinder with piston rod connected to rocker arm provides pressure for the air operated types,



CUT COST ON SMALL WORK. SPEED PRODUCTION - IN-CREASE SAFETY BY USING ROUSSELLE PUNCH PRESS.

Your cost figures will Show that "PRESS TIME" runs high on your larger machines—Especially when producing small parts or in frequent set-ups for light work. Do your small jobs—odd jobs—special work—on a press that is designed and built expressly to save time and money in these operations. Safety devices such as Knockout BAR, the non-repeating clutch are standard equipment on this press without extra cost.

Specifications: Model 10 H, Shown in Cut

SPECIFICATIONS	
Diameter of main bearing and pin	1#"x3#"
Standard stroke	2"
Special stroke (at extra cost) maximum	3"
Top of bolster plate, front to back, right to left	11"x148"
Thickness of bolster plate	14"
Bed to slide, stroke down, adjustment up, (Standard Stroke)	•
Top of bolster plate, stroke down, adjustment up	•
Depth of throat, ram center to frame	5"
Weight of Flywheel	150 lbs.
Speed of Flywheel	200 R.P.M.
Weight complete without skids, (approximately)	975 lbs.
Pressure at bottom of stroke	15 tons
Size of hole in ram for punch shank	1-9/16"
Motor speed and horsepower required	1750-1

IMMEDIATE DELIVERIES-for further information write

CULLMAN **HUBER SALES** 22-13 Steinway Street Long Island City, N. Y.

CLAMP for Every Purpose



Forged Steel Quick Acting Deep Reach Welders



Sizes Available: 34" to 10' opening 1/2" to 16" deep

Write for CATALOG and PRICES on Clamps for all purposes as well as many other tools for use in the Machine Shop.

IN STOCK AT YOUR SUPPLY HOUSE

The Cincinnati Tool Co., 1945 WAVERLY AVE., CINCINNATI, OHIO

START NOW!

Increase Production

End Worker Fatigue By Making Your Drilling Job Easier.



DRILL MASTER RADIAL DRILL

This floor type, heavy duty, precision-made, well balanced Radial is economical in initial cost and operating cost. It offers many features that merit your careful consideration. Drills to the center of a 36° circle . . No. 2 Morse taper . . . Heavy duty ½ h.p. ball bearing motor . . . Full floating, ball bearing spindle assures free and sensitive operation at all speeds.

Send TODAY for detailed bulletin.

Wm. C. Johnson & Sons Machinery Company St. Louis Missouri with a pressure regulator as standard equipment and spring pressure returning points after completion of weld.

Where air supply is limited, a motor driven type is recommended. The new welders of this type are provided with a ½ hp motor, operating rocker arm thru a Reeves variable speed drive (1 to 3 variation), and worm reduction gear and cam. Control switch is footoperated.

Lower arms are designed to provide a range of vertical adjustment giving a throat opening of from 8 to 16", with electrodes together. Standard point opening for a 12" throat depth is 3½". A slight in-and-out lower arm adjustment is also available to insure proper alignment of electrodes. Lower arm may also be rotated in holder so that welding can be performed with electrodes at an angle instead of vertical, when necessary. Standard water-cooled points are provided.

All Progressive rocker arm welders are equipped with heavy duty transformers with water-cooled secondaries and steel cores with pancake coils. Mounted on back of each transformer is an 8-stage heat regulator, quickly adjustable from rear of machine.

Altho the stream-lined design has resulted in an exceptionally compact welder, less than 19" overall in width and less than 55" high, the construction is predicated on requirements for the largest capacities, with welded angle steel framework and wraparound panels. Accessibility for ease of servicing is provided by a door enclosing rear of machine.

A wide selection of timers and contactors, both mechanical and full-electronic is available at extra cost for both mechanical and air-driven types. Air line lubricator and filter, angle drilled horns, solenoid operated clutch, trip or air valves in combination with foot switches are also listed among extra equipment.

Buy United States War Savings Bonds and Stamps

PRECISION ROTARY TABLES

Castings are high grade semi-steel nickel iron, normalized. Many shops purchase these tables to eliminate the expense of costly fixtures. Dividing attachment may be ordered after table is in use. Deliveries on most sizes reasonably quick.

Send for literature with specifications and illustrations.



9"-\$ 97.00

12"— 160.00 15"— 185.00

18"- 220.00

HEAVY DUTY

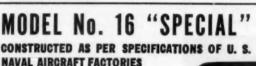
18"-\$350.00

ACME TOOL COMPANY

200 CHURCH ST. NEW YORK, N. Y.

BEWARE OF

IMITATIONS



BUTTERFLY FILING and SAWING MACHINE

(Die Making Machine)

This is a very heavy, powerful machine and is designed for extra heavy filing and sawing, but it performs small work just as well. This type of machine is usually adopted in Ammunition Plants, Airplane Factories and machine shops where heavy and precision f ling and sawing is desired. We also manufacture smaller models—Model D-10° Table; Model E.L. 12° Table;

HARVEY MFG. CORP.

Phone CAnal 6-5170



Registered U. S. Patent Office



Women's Work Gloves Women in industry demand a flex-

Women in industry demand a flexible, comfortably fitting, but sturdy and economical general purpose work glove. Industrial Gloves Co., Danville, Ill., recently perfected such a glove (No. 14640) for a large employer of women workers.



Made of light weight horsehide, the new glove wears well on the tough jobs—yet remains soft and flexible. It is made in 3 sizes—small, medium and large and has open back for coolness and flexibility. An elastic web band across this opening in the back, keeps glove snug fitting thruout its entire life. On the thumb and first 2 fingers is a patch—an extra thickness of leather that adds to the protection and safety of operator and assures extra hours of glove service. A 2" band of leather



TO INSTRUCT NEW MEN IN THE HANDLING OF DIAMOND TOOLS

we will send you a valuable booklet. No charge, no obligation.

KOEBEL DIAMOND TOOL CO. 9352 Grinnell Ave., Detroit

KAEBELITE

Multi-Point, Multi-Set, Multi-Edge, and Single Set. Diamonds for all Industrial Purposes.



DIAMOND ALME TOOLS

Diamonds vary in quality and it is important to use the proper kind for a given job. "Bargain diamonds" are not an economy.

If you don't know diamonds know your diamond dealer. Our 45 years in this field merits your confidence.

RCME DIAMOND TOOL CO.

15 MAIDEN LANE, NEW YORK, N. Y.





"PENCILPOINT" DIAMONDS FOR TRUING GRINDING

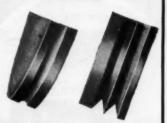
WHEELS

These diamond tools are regular equipment in the grinding of broaches, form milling cutters, ground taps, punches, dies, etc. Send us your inquiries; or blue print of wheel outline for our recommendations. \$1.50 each; discounts in quantities.

For information and circulars write

F. F. GILMORE & CO.

112 Dartmouth St., Boston, Mass.



WAR PLANTS

Steel Boxes for Your Production Needs



SHOP BOXES-Straight Side

No. 401-10*x16*x6*-18 Gauge-\$.85 ea.
No. 402-12*x18*x8*-16 Gauge-\$1.10 ea.

A straight side shop box with rigid handle and hook hole each end. Excellent for shop use where stacking feature is not required. An ideal all-purpose shop box. Sturdy all-welded construction. Heavy skids act as a positive stacking lock and re-inforce box at point of maximum wear.

No. 601 — 10*x16*x6*—18 Gauge — \$.95ca. No. 602 — 12*x18*x8*—16 Gauge — \$1.25ca.

PRICES F.O.B. FACTORY, PHILADELPHIA—ANY QUANTITYI
ORDER TODAY—WIRE WRITE OR PHONE—PROMPT SHIPMENT

AMERICAN METAL WORKS, INC



"MODERN"VISES are precision-built with hardened and ground jaws for rapid production work on milling machines, shapers and drill presses.

CAM VISES—Jaw dimensions: width 4" or 5", depth 1½", maximum opening 2" or 3".

SWIVEL VISES—Jaw dimensions: width 4", depth 1½", maximum opening 3". Gan be used without base.

Write for folders.

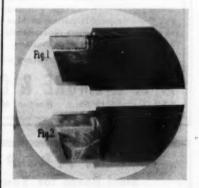
MANUFACTURERS OF PRECISION HIGH SPEED STEEL AND CARSIDE CUTTING TOOLS.

MODERN TOOLS

extends up over wrist to protect that vulnerable spot. Inseam thread sewed. May be purchased in pairs, all rights, all lefts or any combination of rights and lefts to the dozen pairs at no additional cost.

Joining Tips To Tools

The Krembs process, an improved method of joining carbide and all other types of cutting tips and cutting blades to tool shanks, is reported by Krembs & Co., 669 W. Ohio St., Chicago. The



method is adapted to both small and large scale production and can be used with furnace, torch, or spot-welding methods.

The process comprises a specially developed Fluxined-Spelter, brushed on contacting surfaces of both cutting tip and tool shank. Work is then assembled to form a tight fit, and brazed. When completed, it is said, the finished braze looks like a gold-plated joint without waste of joining material, and the cleaning job is almost nil. By this process, 100% perfect bonds are obtained, says the firm.

In the illustration, Fig. 1 shows assembly as it comes out of the brazing oven, showing the small amount of flux scale left on work. Fig. 2 presents the same piece after flux scale has been removed. OPTICAL COMPARATORS

MILLING MACHINES

ROTARY SURFACE GRINDERS

Write

PORTMAN MACHINE TOOL CO. Mount Vernon, N. Y.

Senacon Air Mators speed production of small parts held in fixtures during tooling. They provide uniform, prime power for many forming operations. Rejects minimized. Tool engineers enthusiastic. New bulletin now available.



SMITH - JOHNSON CORPORATION 623 E. 12th St. - Los Angeles, Colif.



MEYERS "Dia-Brasive" MULTIPLE DIAMOND POINT DRESSERS

for Efficient, Economical Service

With "Dia-Brasive" Multiple Point Dressers, numerous sharp points are always exposed to the work, or face of wheel. New points can be secured by turning dresser a quarter or half turn. The small diamonds are more reasonable in price, and remain sharp longer, than large stones. We also make a complete line of single pointidiamond dressing tools. Special dressers built to order.

Write for new literature.

W. F. MEYERS CO., INC. Dept. BB, BEDFORD, IND., U.S.A.

ACCURACY

ARE ASSURED WITH

OLIVER MAKING MACHINES

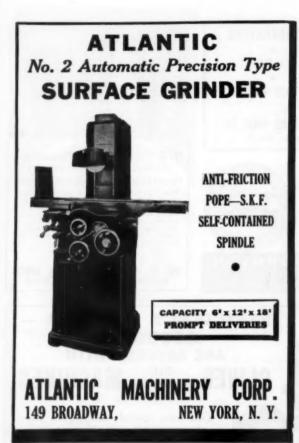
Model S-1

We also build: Drill Grinders— Cutter Grinders— Face Mill Grinders— Tool Bit Grinders You can speed output on Dies
—Gages—Cams—Templates—
Experimental Work—
You can use less skilled operators.

Large Savings - Small Investment.

Send for Bulletin Today.

OLIVER INSTRUMENT CO., 1408 Maumee Street, East, Adrian, Michigan



Accidents—Axis Ally

The nation's manpower for years to come is being killed off by avoidable accidents faster than by any single dis-

That is the report of National Safety Council in its 1942 edition of ACCI-DENT FACTS.

Based on accident experience thru 1941, Accident Facts reports: AGES 1 to 4: Accidents are the most

important cause of death, pneumonia

second. diarrhea and enteritis third.

AGES 5 to 9: Accidents most important cause of death—four times as many deaths as appendicitis and pneumonia, the next causes.

AGES 10 to 14: Almost three times as many deaths from accidents as from the second cause. heart disease.

AGES 15 to 19: Accident deaths most numerous. Tuberculosis second - only threefifths as many deaths as accidents.

For the ages 3 to 25 years, accidents kill more persons than any disease. For the ages 3 to 38, accidents kill more males than any disease.

Two hundred thousand soldiers. sailors or marines could have been supplied with war equipment produced in the time lost thru accidents in 1941. But this equipment wasn't produced. savs

the book, because men who could have turned it out were put out of commission by accidents just as effectively as tho they had been shot down by the enemy.

A total of 102,500 Americans were killed by accidents last year-9,300,000 injured, 350,000 permanently disabled. Of the total accident-dead, 18,000 were killed while working at their jobs. Among the victims were many skilled and highly trained technicians and



Mechanized warfare demands mechanical parts infinite in variety and inexhaustible in quantity. We are proud to supply such parts to the utmost of our skill and capacity.

SPECIAL BOLTS, NUTS and STUDS DIE SINKING and DROP FORGINGS SCREW MACHINE PRODUCTS • HEAT TREATING SPRAYED METAL EQUIPMENT

Estimates gladly submitted. Send samples or blueprints. Catalog on request.

RHODE ISLAND TOOL CO.

148 West River St., Providence, Rhode Island
Serving American Industry Since 1834

RITCO

Cut Dressing Costs with WILLEY'S



No resetting required.
Accurate, precision dressing.
For all makes of grinders.
Lower production costs.

Layer upon layer of natural, whole diamonds, in tungsten carbide matrix. Many sharp cutting points in constant contact with grinding wheel during the entire life of the tool. Make comparative tests, for quality and cost per dress-

ing. 4 standard sizes. Prompt shipment. Prices include holder. Order today! Ask for Bulletin 142, covering Willey's Standard Tungsten Carbide Cutting Tools and Torpedo Type Wheel Dressers.

No.	Usable Contents of the Diamonds			QUANTITY PRICES			
	Diameter	Length	1-25	26-50	51-75	76-100	Diameter
W-3	18	258	\$11.00	\$10.00	\$ 9.00	\$ 8.00	6 to 12
W-4	33	3/6	13.00	12.00	11.00	10.00	12 to 20
W-5	3/8	33	15.00	14.00	13.00	12.00	20 to 24
W-6	18	78	17.00	16.00	15.00	14.00	24 to 42

WILLEY'S CARBIDE TOOL CO.

1344 W. Vernor Highway,

Detroit, Michigan



ON THE NEW AT DIF-FILING MACHINES



Can be used for all kinds of die making. The overarm is constructed so that the file and saw attachments may be interchanged with little effort. The
holddown fingers are attached directly to the overarm. Working surface of the table, which tills two
directions, is entirely clear. An improved type chuck,
consisting of movable hardened jaws, holds both
saws and files. Screw adjustment makes changes
eavy and fast. easy and fast.

\$125,00 Net Price, complete with meter-F. O. B. CHICAGO

103 S. Clinton St., Chicago,

other industrial experts. Another 32,000 workers died of accidents off the job.

It is your patriotic duty, states Accident Facts, to protect yourself and others from accidents, that the time lost from production may be sharply cut-that we may produce the weapons of war. As an example of what could have been built in the 460,000,000 mandays lost in 1941 because of accidents. the Council offered this list: 20 more batteships AND 100 more destroyers AND 9,000 more bombers AND 40,000 more tanks-in addition to what actually were built.

Manufacturers building military aircraft for the destruction of enemy lives and property were particularly effective in protecting from accidental death or injury the workers who built the death-dealing machines.

Of 31 industries studied, the aeronautics industry was among the top five for 1941 in terms of both accident frequency and severity, according to the Council's yearbook.

Workers in the aeronautics industry suffered only 7.40 disabling injuries per 1,000,000 man-hours, as compared with an average of 15.39 for all 31 industries.

Severity of accidents in the aeronautics industry was 30 days lost per 1,000 man-hours, compared with an average of 1.53 for all 31 industries. Only the tobacco industry, with a severity rate of 20, had a better record in this respect than the aircraft and aircraft parts builders. Tobacco, cement, steel and glass, in that order, had better frequency rates than the aeronautics industry.

A lot of industrial workers literally fell down on the job in 1941, continues the volume—and their falls cost a lot of money as well as time and pain. It shows that falls of one kind or another accounted for 23 per cent of all compensation paid for accident cases in industry last year.

"Handling objects" resulted in a larger number of accident cases than falls-24 per cent of the total, against 18 per cent for falls-but "handling obiects" accidents were less severe and drew only 15 per cent of all compensation paid.

CERRO ALLOYS for Prompt Shipment

CERROMATRIX (Melting Temp., 250° F.) For securing punch and die parts, anchoring machine parts without expensive drive fits, for engraving machine models, stripper plates, chucks, short run forming dies and other metal-working applications.

CERROBEND (Melting Temp., 158° F.) Used as a filler in bending thin-walled tubing to small radii. Easily removed in boiling water. Also used for aircraft assembly jigs, templates for forming dies and other purposes.

These two low-temperature-melting and expanding alloys are helping to speed up production of war materials for the Army, Navy and Air Force.

HEPRESENTATIVES AND DISTRIBUTORS

Brklyn., N.Y., Beimt. Smett. & Ref. Wks. Ansonia, Conn., Jackson Associates Soston, Mass., Jackson Associates Philadelphia, Pa., Mch. & Tool Design. Co. Cleveland, Ohio, Die Supply Co. Detroit, Mich., Castaloy Corporation Design. Co., Inc., Milwauker, Wis., Harry C. Kettleson, Inc., Milwauker, Wis., Harry C. Kettleson, Inc.

St. Louis, Mo., Metal Goods Corporation Kansas City, Mo., Metal Goods Corporation Tuisa, Okia, Metal Goods Corporation New Orleans, La., Metal Goods Corporation New Orleans, La., Metal Goods Corporation Houston, Tex., Metal Goods Corporation Houston, Tex., Metal Goods Corporation Los Ang., Cal., Castaloy Corporation Mentheral, Can., Dominion Merchants Ltd., London, Eng., Min. & Chem. Prod., Ltd.

CERRO DE PASCO COPPER CORPORATION

The New CATSKILL - WET-TYPE Abrasive Cut-Off Machine



e

d

Abrasive wheel cutting is the modern way to speed up operation and lower cutting cost. This machine cuts tubing to 3", solids to 2" accurately, smoothly. Especially recommended for cutting high alloyed hard steels and many other materials. Designed and engineered for high production, ease of operation, safety, and long life. Prompt delivery.

For detailed information, write for Bulletin No. 6.

CATSKILL METAL WORKS, INC. - CATSKILL NEW YORK

PRECISION GROUND FROM SOLID STOCK

The unfailing accuracy required for production today is an integral part of every Sossner tap. It's one of the things you know you can count on.

Cut a perfect thread every time.
Durability—
plus accuracy—
that will please the most shop-wise man.

Now scheduling for November and December delivery.

225 CENTRE ST. SOSSNER 26 BROADWAY

Falls and operations involving the handling of objects of one kind or another, combined, caused 42 per cent of all compensated occupational accidents and drew 38 per cent of all compensation paid. Machinery, vehicles, falling objects, hand tools and actions of stepping on or striking against" each contributed smaller numbers of accidents and drew smaller fractions of the total compensation bill.

Mineral Aggregate Production Screens

Printed copies of Simplified Practice Recommendation R147-42, Wire Diameters for Mineral Aggregate Production Screens, are now available. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each. A discount of 25% on orders of 100 or more copies is available to those desiring to purchase a supply for business purposes.

Ohmite Ferrule Resistors

Easy interchangeability without the use of tools, is claimed for these resistors by their maker, Ohmite Mfg. Co., 4835 Flournoy St., Dept. 2F, Chicago. An even winding of resistance wire on a ceramic core is protected by vitreous enamel coating. Wire is terminated on metal bands or ferrules to permit mounting in fuse clips. Ferrules are cup, sleeve, or cartridge type.

Special ceramic cores are available which, with special coating, will withstand temperature shock test of repeated immersions, alternately from ice cold water to hot. Protective coatings which pass salt water immersion tests are also available.

Ferrule type of resistor is particularly applicable to use by Navy, Signal Corps, on Army aircraft and on railroads. Units in wide range of sizes can be supplied in accordance with Navy specifications.

HOPPERS

THE FASTEST FEEDING HOPPER EVER DESIGNED

Feeds Screws, Screw Blanks, Nuts, Rivets, Pins, Bearing Rollers, Plain Washers, Discs, Bullet Cores, Special Parts.

Hoppers Adaptable To Any Machine.

Send Sample Parts For Feeding Speed.



DETROIT POWER SCREWDRIVER CO. 2809 W. FORT ST., DETROIT, MICH.

Its STANDARD for War and Peace

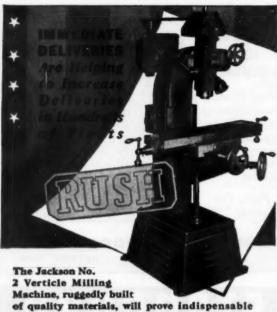


All equipped with Push Button Safety Starter, Safety hinge door guards adjustable to wheel wear. The Standard line includes all types of grinders, Buffing and Polishing Machines and Speed Lathes.

WRITE FOR CATALOGUE

TYPE 24 FAS 2 H.P. 12*z2* GRINDING WHEELS
TYPE 36 FAS 3 H.P. 14*z2*2* GRINDING WHEELS
TYPE 40 FAS 5 H.P. 14*z3* GRINDING WHEELS
TYPE 50 FAS 5 H.P. 18*x3* GRINDING WHEELS

The STANDARD ELECTRICAL TOOL Co.



of quality materials, will prove indispensable for Tool Room or Production applications. 5 speed V-belt drive, sturdy 4½" quill and ¾" apindle capacity 8" x 32" table.

JACKSON

MACHINE & TOOL COMPANY SALES DIVISION 956 Roberts St. Jackson, Michigan

Diamond Tool Care

Too many diamond tools to be reset come back to the manufacturer in really deplorable state, according to Paul Grodzinski, in the British "Machinist." Often the diamond is worn off flush with surrounding metal, from which a considerable amount, needed for safe holding, has been removed by filing or grinding.

After a diamond has been re-set, nobody can know how many corners are still embedded and how safe its hold will be. Therefore, any damage to the

surrounding metal involves risk of making the stone unsuitable for furre - setting. and loosening its support, so that it may be torn out . . . or resulting in total breakage of stone. There is little to be gained thru extending use of a diamond tool in this way, according to the writer: for the truing action of a blunted diamond is unsatisfactory.

Theoretically, the diamond octahedron has 6 to 8 points. But if 3 points are worn off, some of the other points be touched. making the stone no longer useful for re - setting. As a general recommendation, it is said the diamond can be used until it is worn off flush with surrounding the Of course, metal. the metal should never be touched. It is however, recommended that if the diamond shows a flat face of more

than .005" width, its position relative to grinding wheel has to be changed.

A diamond worn absolutely flush with the surrounding metal has been improperly used. Proper usage will cause a dome - shaped point to be formed.

Grodzinski recommends that each precision machine have a separate diamond, for which the operator be held responsible, as for his other tools, and not permitted to use another's diamond tool. Such method may appear too expensive for many firms, despite considerable reduction in diamond consumption afforded. In such cases, a designated operator, or the storekeeper may be given responsibility for tools and their condition. He should have sufficient reserve stock to permit sending tools for re-setting at correct times. A record should be kept of each diamond in the interests of both supplier, who is anxious to give good service, and the purchaser.

tal

of

ne

r-

ng,

ts 1

it

tal

ie.

be

- 3

li-

nis

to he

a is

he

on

ts.

re

of

nts

ed.

ne

or

nhe is th ng se,

nhe a re

ve ed.

en ill be

e_

aeld nd

nd

coo

n-

43

Besides data regarding weight of diamonds, (new and after re-settings) such record should show kinds of machines and grinding wheels used. Grinding machine should be systematically controlled, so that truing devices are in suitable condition.

Further remarks refer to the fit of the tool shanks in reception bores of truing devices. Cylindrical shanks, by frequent use and redressing, are reduced in size, the hole increasing in size with wear. Thus the original fit is lost. Many operators try to prevent movement by too much tightening of the clamp screw, bruising the holder.

• M - B • AIR-LINE FILTER and AUTOMATIC LUBRICATOR



PNEUMATIC

GRINDERS

Removes 96% to 97% of All Water, Dirt and Scale from Airline.

Air passes through a series of brass discs with .002 spacings, providing the finest degree of filtration obtainable by any known method. Then, as the air passes through head of Lubricator, oil is delivered into the purified air line in any desired volume.

Write for FREE TRIAL Offer

M-B PRODUCTS

EXPORT OFFICE

MASTERDRIVES ON NORTON GRINDERS



MASTERDRIVES are specially engineered for the job, easy to install. Famous Master Speedramger on work head gives infinite speed variation over nine to one range, better control of finish. Feed drives to accommodate type of feed. Precision belanced motor, automatic belt tensioning device, are etandard on wheel. Each unit complete, 550 different specifications for all requirements. Write for literature and name of representative.

MASTER ELECTRIC COMPANY

Industrial Equipment Division DAYTON, OHIO





Tapping Machine Lead Screw Control



Cleveland Tapping Machine Co. offers a new Model D lead screw tapping machine which is said to be 100% automatic. Direction of rotation is pushbutton-controlled. Spindle may be stopped in any position desired and started from that position in either direction. Depth stop gauge is claimed to be so sensitive that reverse of spindle is controlled within two cycles and vertical travel of spindle can be adjusted to exact depth desired by a visible indicator on face plate. This makes it especially useful for bottom tapping. In addition the makers say the clutch is so sensitive it can be instantly adjusted for a 10-32 N.F. or 34 N.C. This is due to smooth operation of the bi-metallic clutch disk. The lead screw assembly is mounted on top of housing while lead screw nut is fastened directly to spindle, and due to the large diameter-14"-makes class 3 fits a simple production job. The machine is equipped with a 1 hp motor for ½" size and 2 hp for 1" size. A 4 speed V belt drive is provided. Spindle speeds are 275, 375, 475, and 600 rpm.



with Etter-Emrick

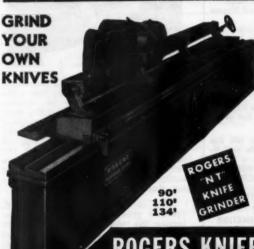
MADE IN 7 SIZES FOR No. O TO 1' TAPS

Clamp one of these attachments to the spindle of a drill press and presto — you have a high-speed sensitive drilling machine. Takes only a few minutes and requires no alterations to the press. QUILL CLAMPS are available for rigid mounting on any press.

BULLETIN No. 2 will give you full details. We'll mail you a copy promptly on request.

ETTCO TOOL CO., Inc. 596 Johnson Ave., Brooklyn, N. Y. Detroit Chicago

MAKERS
OF STECO-Emrick DRILL CHUCKS . TAP CHUCKS . TAPPING ATTACHMENTS
OF STECO-Emrick DRILL CHUCKS . TAPPING ATTACHMENTS



ETTCO-EMRICE

TAP CHUCKS

S sises for No. O to

1º taps. Visible

sures proper insertion of taps. Details in Bulletin No. 6 Collet type chucks also available.

PRODUCTION On Your War Contracts

Knives last longer . . . cut more keenly, more smoothly . . . when sharpened on this heavy-duty ROGERS precision knife grinder. Requires no skilled operator . . . built for steady 24-hour service.

Send for NT Circular; give maximum length of knives.

SAMUEL C. ROGERS & CO. 207 Dutton Ave., Buffalo, N. Y.

ROGERS KNIFE GRINDERS

PRECISION

QUALITY SINCE 188

ng

uh-

be

nd

li-

ed

nnd

d-

a

nis

m

ay

n-3/4

on

ad

of

t-

to

a-

A n-00



Drilling Fixtures

Two interesting uses of the Model 4X Mead Air Clamp are illustrated and described here. Model 4X is but one of the several different Air Clamp models developed for hold-down work by Mead Specialties Co., 15 South Market St., Dept. 3, Chicago. This manufacturer has also created a successful Foot Control for air clamps and other air operated devices, which frees operator's hands and speeds up work.



One of the illustrations shows a handy method of holding an iron casting while it is tapped 3%"—16. A simple wooden fixture to support the casting is the only other piece of equipment necessary. It will be noted that the ram alone is used. Pressure is applied at approximately the center of the casting, thus holding work and fixture firmly against table. The pressure is sufficient to prevent work from turning, due to twisting force of tap.

After each of the 3 holes is tapped, operator presses the foot control, releasing the work. Work and fixture are then rotated to next position and when operator removes his foot from control, the ram descends and once more holds the work firmly for the next tapping operation. On a job of this sort it is a decided advantage to

SPOT WELDING.

FOR INFORMATION

WRITE TO

New, Accurate Tailstock Turrets

Ideal for engine and bench lathes—for special runs, small runs that come through regularly, or for relieving turret lathes. Holds six tools and comes complete with tapered arbor that fits in tailstock. Can be had with straight shank for increasing tool hole capacity on turret lathe. Tool holes are bored, after arbor is fitted to insure accurate centering of tools. Saves time in tool changing and chucking. Quickly pays for itself. Recommended by many users. Immediate delivery (except on Model B1 which requires two weeks). Order from your dealer or write for descriptive circular.

nd 11

i-

y 1

et

c-

ot

ir

1-

nt

d

ie

re

is

1-

d.

re

d

m

ne of Model "A"—2\\\^* dia. with 6 bored \(\frac{1}{2}\) \$18.95 holes No. 1 orNo. 2 Morse Taper Arbor \$18.95 Model "B"—5\\\^* dia. with 6 bored \(\frac{1}{2}\) holes \$32.95 with No. 2, 3 or 4 Morse Taper Arbor Arbor M-del "B1"—5\\\^* diameter with 6 bored \(\frac{1}{2}\) not 1\\\^* holes with \(\frac{1}{2}\) or 1\\\^* straight shank arbor \$37.95 for use on turret lather, F.O.B. Chicago.



E & N Manufacturing Company

3323 Montrose Ave., Chicago, III.



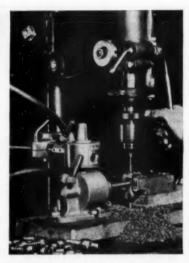
DO YOU Need those light stampings NOW?



Are you "held up" for want of punch press time on light stampings and trimmings? Then perhaps you'll be glad to know that we're featuring thirty day deliveries on ROUSSELLE Punch Presses in order to help solve problems such as yours. So keep those heavy presses going on heavy work—and start a high-speed-with-safety ROUSSELLE rolling on your small parts and light work. Made in 3 sizes—No. 0, No. I and Horn model . . Write, wire or phone for quick information.

Distributors: A few select territories still available.

DAVID J. ROSS CO.



have no locating pegs or other encumbrances on work table. Work can be inserted and removed, as well as positioned and held for tapping with a minimum of lost motion and time.

Work-holding fixture is made of wood for three reasons: (1) It is light in weight and reduces operator fatigue. (2) It provides a better coefficient of friction on work table. (3) Chips getting between fixture and work table will not mar surface of table.

On the other job shown, 2 different Air Clamp models supplement each and more than double output of drill press. The operation calls for drilling a 5/32" hole a little over an inch deep into intake end of a brass valve body. Fixture consists simply of a hardwood base with a built up block at one end having a vertical V notch lined with steel to locate shank of valve body. On top of this block is a steel plate with a hardened drill bushing. Model H4 Air Clamp holds valve body into vertical V notch during drilling. Model 4X Air Clamp, mounted on column of drill press, holds entire fixture in position and alignment.

Today's answer to MORE PRODUCTION

IF you want to step up production as much as six times... cut down grinding time... and lengthen the service life of cutting tools... then switch to W-S cemented carbide tipped tools. Each one is tipped with the correct grade of CARBOLOY best suited to do a cutting job on the metals for which the tools are ordered. (Other brands of carbide can be specified.)

Can be specified.)

We specialize on cemented carbide tools exclusively. We list as standard many tools formerly in the "special" class. Prompt shipment from stock on many types. Catalog 142 sent FREE. WENDT-SONIS COMPANY, HANNIBAL, MISSOURL. Wire or phone your requirements and priority rating.



shanks, Sizes 100 1

WENDT Sonis

CARBOLOY CUTTING TOOLS

Centers • Flute Drills • Care Drills • Counterbores • Spot Facers End Mills • Reamers • Hollow Mills • Lathe Bits • Special Tools

Challenge Abrasive Cut-Off Machine

An abrasive cut-off machine is being manufactured by The Challenge Machinery Co., Grand Haven, Mich., to handle any metal—hard or soft, tubular or solid, including hardened tool steel.

Machine has a capacity up to 1" round and has an adjustable table, 15x14". It is equipped with an elastic cutoff Wheel, 6x1/32x½", and an adjustable safety guard above the wheel to protect operator's eyes. The belt on the side is also guarded. Aball bearing type spindle is used. An adjustable miter gage is included for cutting-off operations.

The machine can be plugged into any light socket. The base is made of cast iron, and an all-steel stand, 16x22x34", is available.

Challenge

DESIGNED FOR HEAVY DUTY

THE NILSON FOUR SLIDE MACHINE

For Swaging, Stamping, Piercing,



Blanking, Forming of coiled metal. One of the outstanding features of this combination power press and four slide machine is the powerful and silent action of the main press slide which is operated by crank motion through toggle or knuckle joints. Strength and rigidity achieved by overhead stay rods. Changing dies is a simple and quick operation as the removable die set is easily accessible. The gripping members are independently operated, insuring a positive pull on long or short lengths direct from the reel.

Write for further information.

The A. H. NILSON Machine Co.

Steel-Stitching Speeds Deliveries

Big steel stitchers, capable of operating at a machine speed of 295 stitches per minute, are saving time and manpower throughout metal - working industries—speeding the manufacture of many war-rushed products, such as floor furnaces for the big housing units now going up in defense areas.

At the Coleman Lamp & Stove Co.,





Wichita, Kans., a Bostitch stitcher forms its own staples from wire and

BUILTFOR SPEED-DURABILITY

THE NILSON-AUTOMATIC METAL AND WIRE

The Nilson Automatic Motal and

Wireforming machine meets today's industrial requirements. Here are some of the features of this machine. Open construction of press and forming tools. Patented slide feed with an independent cam - operated wire gripping device. Power operating wire feed is transmitted through a straight line.

wire feed is transmitted throug straight line. Write today for information.



The A.H. NILSON

BRIDGEPORT, CONN., U.S.A.

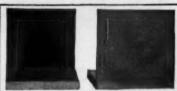
drives them through 2 pieces of .029" Terne Plate, automatically clinching them in a firm stitch. On other occasions 3 pieces of this size are stitched together, and similar machines, used in automotive and other large production work, are able to stitch thru 1/16" cold rolled steel.

Conversion Problems Solved

The Watson-Standard Co., Pittsburgh, announces development of a series of lacquers especially adapted to the conversion from Tin or Terne Plate to Black Plate. These new lacquers developed over a period of several months, are said to have unusual properties of adhesion to the Black Plate, and prevent under-film corrosion. The new series includes lacquers developed to withstand processing for home canning. One of the oustanding features of the lacquers is the fact that they can be made in metallic colors, thus solving an important problem of decoration.

Aero-Thread System

A new 12-page catalog on the Aero-Thread System has been issued by the Aircraft Screw Products Co., Long Island City, N. Y. This Company manufactures the tools and inserts for the Aero-Thread Screw Thread System for reinforcement of tapped threads in light metals such as aluminum, magnesium, etc. It is extensively used on American-built combat aircraft — also in other armament and peace-time applications outside the aircraft industry.



Angle Plates for, Buring Mills, Brills, Grinders, Layout Inspectors. Surface and Lapping Plates, Prempt Delivery

TATRA TOOL CO.

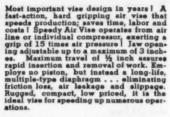
SPEEDS PRODUCTION! CUTS TIME AND COSTS!



MAND FREE OPERATION 3

6 Foot operation leaves BOTH
hands free for fast insertion and re-Complete with Foot Control Value, Air Hose and noval of work. Vise stays open or Fittings closed without constant foot pressure.

FAST! POWERFUL FOOT CONTROLLED!



Write at Once For Circular B-9

BROWN CORP., 5720 ARMITAGE AVE., CHICAGO, ILLINOIS

The Precise 35

Wide range of applicability from heavy production work to fast, precision grinding, cutting, polishing and engraving, is claimed for this neat little electric tool by its makers, Precise Products Corp., 715 Racine St., Racine. Wis.

exacting internal work in openings as small as 1-13/32" diam to a depth of 6".

Cool running under continuous load is emphasized as well as complete insulation dispensing with ground wire in rendering the machine shock-proof. Its case is serviceable, streamlined plastic, said to be grit, dust and mois-



It plugs in anywhere, runs practically without vibration and its exceedingly compact motor is said to develop about 1/7 hp at load speeds of from 20,000 to 35,000 rpm.

Slender spindle head is designed for

ture-proof, for long trouble-free life. Simple, 3-piece construction permits quick taking apart and reassembly, with no screws to loosen or fall out. Motor shaft, and high-precision spindle and high-speed chuck revolve on 4

Air-O-cheko

LEAKPROOF AIR GUNS

Totally Different-Much Better Repeat Orders by Hundreds from Leading Plants Exclusive Patented Design Only Air-O-Cheks have enclosed lever that operates valve thru ball and socket joint. No packing gland. Streamlined.

> Long service—low maintenance. Priced low Types and sizes for all requirements. Catalog on request.



Fittings for Air and Welding Hose Standard and extra long shanks, Shipped from stock, Catalog on request,

Made of Bar Brass and Stainless Steel.

Attdira

Try an Air-O-Chek and see the difference. Order sample on approval from stock. Just specify size of hose.

AIR-WAY PUMP & EQUIPMENT CO., 401 S. Jefferson St., Chicago

Get acquainted with the modern air gun.

C-F POSITIONERS

Model 200 20,000 lbs. 20 inches away from table, 8 inches off center.

With push batton control these giant C-F POSITIONERS (smaller one illustrated) rotate really large heavy and cumbersome weldments a full 3600, tilts them to any angle to 1335 from horizontal, moving thru both planes at once to save valuable minutes; and holds in any position; permitting strong, smooth, flawless down welding on all surfaces.

C-F Positioners comprise a complete line of pedestal mounted positioners from small (1200 lb.) hand operated models to those electrically operated giants.



Write for new Bulletin WP22 "Faster, Better and More Economical Welding."



CULLEN-FRIESTEDT CO.

Model 300 30,000 lbs. 24 inches



precision - machined ball bearings, joined with self-aligning elastic coupling, said to eliminate vibration and excess wear.

Bearing chambers are totally enclosed to prevent loss of lubricant, and allowing forced ventilation of fan without use of air filter. This ventilation is said to keep inner parts at low temperature for long wear and ease of handling.

In addition to this grinder, other products of the firm include a hand motor of similar design, with a reducing gear, said to operate at 1,500 to 2,500 load rpm, and equipped with the same motor as the Precise 35. This machine is designed for heavy cutting, drilling, brushing, etc. and is said to take cutters to 1" and drills to 5/16" diam.

The firm also makes an electric screw-driver (600-900 rpm) with the Precise Clutch, preventing any damage to screws and nuts, with capacity to thread diam of 1/3".

All of these items are detailed in the company's bulletins on these tools.

"Wonder-Wood"

Where desirable to avoid lubricating due to inaccessibility, noise, or spoilage of product, Lignum - Vitae, says a bulletin by Lignum-Vitae Products Corp., 730 Boyd Ave., Jersey City, N. J., has no superior. Its density and homogeneity make it capable of withstanding, conservatively, working pressures to 2000 lb psi. Its specific gravity is 1.14; modulus of rupture, 11,200 lb psi; maximum crushing strength, 10,480 psi.

High resin-content of Lignum-Vitae, running about 30% of its weight, consists of natural gum, which, combined with its pressure-resisting qualities, adapts it for an ever-increasing number of mechanical purposes where introduction of lubrication is not practical or dependable.

Thus, it is used for propellor shaft bearings in ships, roll-neck bearings and on food or liquid-handling machinery and many other kinds of equipment where oil is not feasible or desirable.

Draw Press for Shell Forgings



This horizontal hydraulic double-acting draw press produced by Baldwin Southwark division of The Baldwin Locomotive Works is of 200 tons capacity. It is being used for the production of 155-mm shell forgings.

It is equipped with four die heads and one stripper head. The extreme end of piston is supported by a well guided crosshead, having adjustable shoes on the 2 press columns. The drawing mandrel extension is guided in a bronze-lined guide casting. The machine is mounted on a structural steel bed. The 4-way operating valve and piping are mounted on the top cylinder and a pilot valve for operating the main valve is conveniently located.

The press has a stroke of 11', with a piston diameter of 19" and piston rod diameter of 14". Floor space required is 45x6'.



Headquarters for Standardized Die Sets, embodying many exclusive features and embracing more than 195,000 stock sizes and 46 different styles. A die service that is unsurpassed. Let us prove it!

Send for our new 336 Page Catalon.

E. A. BAUMBACH MFG. CO.

1810 So. Kilbourne Ave., CHICAGO, ILL.

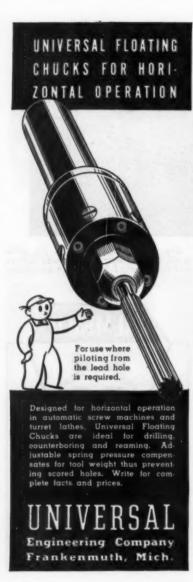
CUTS GRINDING COSTS 1/2-3/4-and MORE



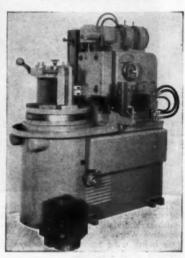
HEAVY DUTY

3 Phase 60 Cycle No Braske

GASTON POWER TOOLS



Gun Parts by Auto Production Methods



Normally the milling of extractor trunnion pockets in this gun breech ring would be a highly specialized tool-shop operation — with production proportionately limited. Today's urgent need for volume production has resulted in the designing and building of this special machine by which auto production methods are applied with a corresponding gain in output.

The operation involves cutting kidney shaped slots and is done without trac-

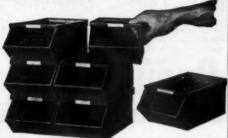
ers or duplicators.

When work piece is loaded in locating fixture and cycle starting button pressed, tool spindles start to rotate and tool spindle slide advances into position while fixture table starts to oscillate the work thru a short arc which controls shape of slot.

The slot is cut in steps which are adjustable from a few thousandths to 1/32" deep per oscillation of table. Oscillation of table and tool advance are hydraulically operated and electrically controlled. (Hydraulic step-by-step ad-

PARTS

where you
want them—
when you
want them



You'll save time, space and labor handling parts and materials when you use these patented STACKBINS. STACKBINS keep parts instantly accessible—eliminate waste hand motions—stack compactly to form units of exactly the right shape and capacity—make order filling or assembly work faster, easier, more efficient.

STACKBINS

Write today for full story on patented STACKBINS, and learn new lessons in efficiency. Stackbin Corp., 55 Troy St., Providence, R. I.

NOW YOU CAN GET CHALLENGE SEMI-STEEL BENCH PLATES

TWO INCHES THICK

... PRECISION GROUND!

413

These small semi-steel bench plates are now available for many types of work, particularly inspection and assembly of small parts. They provide an accurate surface and are built for lasting strength and rigidity. All four sides are machined at exact

right angles to the top. Challenge Precision Ground Bench Plates are made in nine standard sizes, from 8x10 to 18x18 inches. Other sizes to order. Prompt delivery on standard sizes. Write for new illustrated catalog on this and other precision equipment.



THE CHALLENGE MACHINERY CO.

GRAND HAVEN', MICHIGAN, U.S.A.

DUST and DIRT . . . DESTRUCTIVE AS BOMBS

. destructive to machinery and equipment—dangerous to health—serious fire hazards. Avoid breakdowns, delays and risks the CADILLAC way. Ask your mill supply dealer or write us.

All armed services and war production plants use Cadillacs.



Inquiries invited for universal type 1/50 to 1 HP meters.

CADILLAC

PORTABLE ELECTRIC COMBINATION

BLOWERS AND SUCTION CLEANERS

CLEMENTS MEG. CO. 6651 S. NARRAGANSETT AVE. CHICAGO. ILL

vance can be disconnected and tool advance accomplished manually, if desired.)

The machine consists of 3 principle sections — base, containing hydraulic equipment and piping, rotating table mechanism for the work-holding fixture, and, spindle head housing with its column and feed mechanism.

Base contains mechanism to oscillate table which is hydraulically actuated by means of 2 hydraulic plunger cylinders. Control of this mechanism is by means of reciprocating cycle hydraulic panels, mounted on side of machine and equipped with trip-dogs to adjust length of the arc thru which table oscillates. The plungers register against solid stops at end of stroke for accurate length of slot cut.

Work spindle is driven from an electric motor mounted on top of base, thru pick-off gear drive thru a splined shaft, thence to spindle housing proper.

Small amount of room available for spindle housing proper made it necessary to employ needle roller bearings on spindle itself with ball bearings taking end thrust. Spindle housing in column assembly is mounted upon ways which allow that assembly to move out of the way for loading and unloading.

Column contains hydraulic fluid motor and lead screw mechanism which moves tool into work in steps varying from a few thousandths to 1/32".

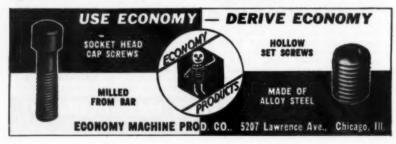
A problem in designing of this machine was the extremely small clearance—only 1/16"—at point where tool and spindle head enter work. Accordingly, movement of spindle head is thru a dog rail mechanism which has an 8-1 ratio over movement of tool itself.

This controls depth of slot and also determines a return stop position.

Stops for main slide are bevelled at 45° and located one on either side of ways. These not only stop slide but also hold it down on ways for greater rigidity.

Coolant is contained in a sidemounted coolant trough equipped with a chip basket.

Designers and builders are the Snyder Tool & Engineering Co., 3400 East Lafayette. Detroit.



TCM-HS Steel Booklet

A 12-page booklet describing the new Jessop TCM Molybdenum - Tungsten High Speed Steel is announced by Jessop Steel Co., 603 Green St., Washington, Pa.



Information regarding its advantages and performance as compared to 18-4-1, also its analysis, typical applications and heat treating procedure, are covered in detail.

The Value of a Smile

It costs nothing, but it creates much. It enriches those who receive, without impoverishing those who give.

It happens in a flash and the memory of it sometimes lasts forever.

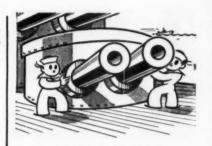
None are so rich they can get along without it, and none are so poor but are richer for its benefits.

It creates happiness in the home, fosters good will in business, and is the countersign of friends.

It is rest to the weary, daylight to the discouraged, sunshine to the sad, and nature's best antidote for trouble.

Yet it cannot be bought, begged, borrowed, or stolen, for it is something that is no earthly good to anybody till it is given away!

(-C. D. V. in National Safety Council News Letter)



THEY'RE NOT BIG GUNS— BUT THEY'RE MIGHTY IMPORTANT TO UNCLE SAM'S ARMS PROGRAM

In plants from Maine to California Universal Drill Bushings are busy doing their bit toward stepping up the speed and efficiency of America's Arms production. Because of their straight and round superfinished bores. Universal Bushings save tools and assure accuracy. Write for further facts.



NUMBERALL Numbering Machines Automatic and

Hand Operated

for stamping in Metal, Fibre, Plastics, etc. Do faster and better work than Single Steel Stamps. For Marking Metal Parts, Name Plates, Metal Checks, etc. Write for Catalog.

HUMBERALL STAMP & TOOL CO., Inc. Huguenot Park, - - Staten Island, N. Y.

Precision Drill Grinder



Simple to operate—dependable—speedy—this Precision Grinder will enable you to produce perfect points on standard twist drills in sizes from No. 41 (.096) to %8 (.625).

Send today for more details.

Star Machine & Engineering Corp. Division Star Electric Motor Co.

licomfield, . - New Jersey

Plastic Utility Lantern



A new type of general utility lantern has recently been developed having an all-Tenite housing. This lantern features an adjustable focal length and a small light bulb on an extension cord that may be used to illuminate objects not made visible by the larger beam. The colorful Tenite housing presents a smooth lustrous surface that is non-tarnishing and rustproof. It is exceptionally light in weight, easy to handle, and yet so strong as to be virtually unbreakable. This lantern is being adopted for use by railway car inspectors, industrial plants, and servicemen

GROBET ROTARY FILES ground from the solid

Ask for Catalog WG

the most complete catalog
of its kind, illustrating hundreds of rotary files hand cut,
milled cut, ground from the solid;
also diesinkers' burs.

GROBET FILE CO. OF AMERICA 3 Park Pl., New York, N. Y.

thruout the country. It is available in red, black, and olive-drab Tenite.

The Focolite lantern is manufactured by the Focal Co., Downey, Calif. The Tenite housing is molded by Modern Plastic Co., 4641 Pacific Blvd., Los Angeles. Tenite is a product of Tennessee Eastman Corp., Kingsport, Tenn.

Speeding Spray-Gun Operations

In a profusely illustrated 15-page booklet—"How to Speed Up Your Finishing Operations." the technical staff of the Finishes Division, E. I. du Pont de Nemours & Co., Wilmington, Del., explains the 11 factors that must be properly controlled in order to attain the utmost efficiency in spray painting.

Because today manufacturers are confronted with new finishing problems as a result of conversion, and many semi-experienced spray-gun operators work on the production lines, the pocket-size booklet is expressly devised as an educational piece to help speed output, avoid rejects and wasted finishing materials.

The 11 points for efficiency and conservation described in text and illustrated by photographs and diagrams are:—Temperature of Paint; Air and Fluid Pressures; Viscosity of Paint; Adjustment of Spray Gun; Handling of Spray Gun; Triggering of the Gun; System in the Strokes; Uniformity of Coating; Thickness of Film; Causes of Rejects; Touch-Up Procedure.

Wernon 7" ROTARY TABLE



Precision ground top and bottom - Substantially ribbed. 4 table quadrants calibrated 0 to 90° each. Friction looded worm dial graduated in 240 minutes. Overall height only 24". Write for folder!

Worker Line of Hostonital miles, Vietteds and Ostonital



Labor and Time

Eliminate heavy lifting. Cut handling

swivels and locks in any position. Can be varied 151/2 by slight foot pressure, leaving operator's hands free. Engineered and built by tool engineers, experienced in production of special machines, dies, jigs and fixtures for exacting requirements.

Send TODAY for illustrated catalog No. 2.

MIDWEST TOOL & ENG. CO. 112 Webster St., Dayton, Ohio

5000 SIZES Files SHAPES AND SWISS FILES

Ask for Catalog WF.

The most complete catalog of its kind. Lists 5000 different shapes, sizes and cuts of GROBET Precision Swiss Files. Ask also for catalog WM on files for filing machines.

Learn more about these Chrome Steel Files that have won a reputation for utmost precision and durability.

GROBET FILE CO. OF AMERICA 3 Park Pl., New York, N. Y.

40



HIGH SHARPENING COSTS

No. 57T Automatically Sharpens Metal Saws in gangs up to 8° in dia

Metal Saws in gangs up to 8° in diameter. Takes gangs up to 3½° thick. The saws are automatically indexed and sharpened within variation of plus or minus.001 of exact diameter of entire lot.

Write for Folder 57T.



THE WARDWELL MFG. CO.

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise Na.	Width of Jaw, lockes	Opens	Weight
1D	31/2	31/2	121/2

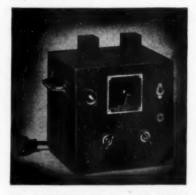
Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

YOST MFG. COMPANY
1335 SO. MAIN ST.
MEADVILLE, PENNSYLVANIA

Demagnetizer-Etcher

A sturdy, all - around unit, recommended for almost any shop, is the DeLuxe combination demagnetizer and etcher, announced by Grinding Machinery Co., 2832 E. Grand Blvd., Detroit, Mich.



Demagnetization is accomplished by throwing the lower switch and passing work over magnetic poles at top of the unit.

Etching is controlled at upper switch with convenient 6-station selector to adjust depth. Rubber extension cord, plug, and special etching stylus with self-cooling holder are part of the equipment supplied. Operates on 110-v, a-c current, red light indicator signaling when unit is in operation. Size —7x6x6" high. Weight about 10 lb.



The GLENNY Adjustable-Expansion BROACH

Produces low cost, accurate keyways. Eliminates set-up time. Self aligning. Interchangeable parts. Adapted for arbor press, mechanical or hydraville presure. Speeds up production. Cutter bars in carbon or high apoed steel. Details? Write!

EAST SHORE MACHINE PRODUCTS CO. 833 E. 149th St., Cleveland, 6

EVANS High Speed Steel REAMERS



LOOK AT THESE FEATURES

- No honing. Will not chatter.
- Chrome-like finish.
- Perfect alignment.
 Full bearing surface.
 Left and right spirals.
- 50 to 80 thousandths expansion.
 Cannot fall in slots or oil grooves.
 Extension pilots for line-up work.

WILL SHIP ON 30 DAY'S TRIAL

EVANS FLEXIBLE Ravenswood & Wilson Ave.,

R CO. WRITE FOR CIRCULAR REAMER

450 Ton Angle Type Press For molding phenolic plastics, this



450 ton angle type hydraulic press has been developed by Lake Erie Engineer-ing Corp., Buffalo, N. Y. Illustration shows vertical and horizontal operating units complete and ready for connection to accumulator pressure system.

Platen measures 24"x50". Vertical stroke is 12" and horizontal stroke is 10". Main bed of press is of rugged design cast in 1 piece to maintain cor-rect vertical and horizontal alignment.

Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminase spoilage of other methods. 7 sizes U.S.S.—Inexpensive last for years.

Write for Circular NIELSEN TOOL & 1859 Gardner Ave. Berkley, Mich.



Have extra (control a liquing cards that hold all hooks in position prevailing card and waste—every back in such a TEEL GRIP Flexible Leeing (the type applied with a hammer) in convenient baces or long lengths with 2-piece himpad racker pins.

diate Belivery on both types. Write for Circulars

ARMSTRONG-BRAY & CO.

KEYSEATERS



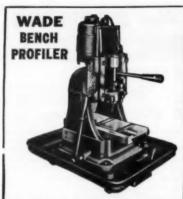
Mill keyways in the run or on the ends of shafting already erected _ save money on alteration, erection, and repair work.

Made in 4 sizes, for hand or motor operation.

Write for Bulletins and prices.

JOHN T. BURR & SON 29 Kent Ave. Brooklyn, N. Y.





For rapid production in recessing and slotting operations.

WADE TOOL CO.

WALTHAM, 1-: MASS.

ALSO WADE BENCH LATHES AND

HAND ENURLING TOOLS





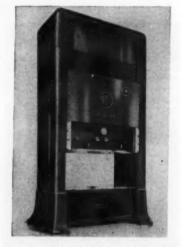
THE PRECISION UNIVERSAL TOOL HEAD



brings all adjustments under absolute micrometric control of the operator without stopping tool or machine. In lig Borer, Milling Machine or Horisontal Boring Mill, it bores, faces, counterbores, turns outside diameters, mills flast surfaces and slots, under-cuis, recesses, back-faces and does an almost limitless range of "sheadche" jobs. Send for bulletins. Address all communications, inquiries and orders to

THE PRECISION TOOL COMPANY
P. O. BOX 155, BROOKLYN, NEW YORK
Cable Address: "Pretool-New York" Tel: Main 4-1064

Bliss Heavy Duty Press



A new Bliss development in their line of heavy duty presses is a 2-Point enclosed type press with 315 tons capacity and 84" between uprights. It has double gearing running in a bath of oil. The press is of 4 piece tie rod construction. The crown, bed, slide and uprights are steel castings. The press is also furnished with a hydraulic friction clutch, hydraulic brake and an air counterbalance. Further specifications are available from E. W. Bliss Co., 1420 Hastings St., Toledo, Ohio.

Preventive Maintenance

Preventive Maintenance—the "how" of keeping plant machinery running without breakdown or other troubles—is obviously to the fore in every plant manager's thoughts these days of "round the clock" operations.

Consequently, the abbreviated, "to the point" suggestions made by Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland, on a blotter (for handy reference) and widely distributed should be especially useful.

The A B C's of preventive maintenance have been condensed almost to the brevity of the "Stop, Look and Listen" so familiar at railroad crossings, in four admonitions:

Look—For oil, water, coolants, etc. that may be dripping or splashing onto windings . . . oil leakage from bearings . . . oil ring turning . . . poor commutation (on d-c) . . . springs on brush-holders . . . obstructions to ventilation.

Listen-For slipping belts . . . noise

due to loose pulleys, gears, couplings . . . noise due to rough commutator.

Feel-For abnormal heat . . . vibration . . . condition of commutator.

Sniff—For overheated insulation . . . injurious fumes.

All of the foregoing divisions could undoubtedly be elaborated on. And even with good inspection and proper operation it will unquestionably pay dividends to remove a motor once a year, take it apart and clean it thoroly, giving the windings a spray coat of good insulating and oil-resisting varnish. Using a color in the spray coat helps show up dirt, oil, etc., on subsequent inspections.

While motors are apart, bearings can also be cleaned, inspected and changed, if necessary. Air gaps can be checked, and commutators, brushes, brush-holders and other vital motor parts restored

to A-1 condition.

Buy United States War Savings Bonds and Stamps







DROP FORGED CLAMPS



Extra Strong-Longer Life

Products Engineering Company's quick acting iig clamps are the only drop forged clamps available—they're stronger—have exceptional opening and closing speed and a positive lack impervious to pressure and vibrations—if pays to specify them. Available in many models and sizes from midget to 6" clamping bars. Send today for file size catalog.

PRODUCTS ENGINEERING CO.

Acromark Brander No. 40

Commonly used for branding tires, acid carboys, packing cases, wet belts, packing and plastic materials, this tool can also be adapted to innumerable other marking purposes, says Acromark Corp., 15 Morrell St., Elizabeth, N. J.



Letters or figures can be interchanged in the holder and interchangeable dies can be substituted for branding names, trademarks and Government emblems.

Ample size heat unit is protected by the twisted metal guard. Heating element extends into die holder to throw the most heat to marking head for good branding results.

Type and dies are a brass or bronze alloy for some purposes and for others, steel is used. Special branding heads can be made for design or name branding only. Sizes to suit various marking requirements are available.

1 11

PLUNKET IMPROVED VISES We make a complete line of modern vises for drill presses,

shapers, milling machines and grinders. Hustration shows our standard milling machine vise as regularly furnished and stocked.

In ordering this vise give size of slot in table: No. 10—6° jaws, 1½° deep, opens 5°, vet. 45 No., \$38,00 No. 20-10° jaws, 2¼° deep, opens 8½°, vet. 120 No., \$2.00

Best material and workmanship. Prices are net f. o. b. Chicago. Dealers inquiries are solicited. Write for folder TODAY.

J. E. Plunket Machine Co., 1823 W. LAKE ST.

Worth Building Your Whole Machine Around!



DISTINCTIVE FEATURES

The soft steel blades are made in pairs, pressed thru slots in the heavy steel back plate, then welded to the plate. The blade tips are pressed thru slots in the inlet disc then bent back against the spring of the steel blades. This patented construction results in an exceptionally rigid wheel and prevents loose blades, as no rivets are used in fastening the blades.

The heavy cast iron machined hub is riveted to the back plate and will not crack or become loose on the driving shaft.

5"x1" to 12"x6"

5"x 5" to 12"x12"

Janette Manufacturing Company
556-558 West Morroe Street Chicago, III U.S.71

Masonite Lockers

Literature is now available on a new line of Masonite Lockers, Wardrobes and Storage Cabinets to meet the war emergency. Products of Interior Steel Equipment Co., 2352 E. 69th Street, Cleveland, O., construction of Masonite saves critical materials, yet harmonizes, is similar to former steel products and overcomes objections of ordinary wood lockers and cabinets.

Stanley Tool Guide

An informative hand-book for anyone who uses tools is offered by Stanley Tools, New Britain, Conn. It was first developed for use in school shops, but today, with industry so busy training new men and women, this book has been selected by many firms as a training text book. Price of the book is 25c per copy, postpaid, which just covers cost of printing and postage.

U.S. WAR

BONDS



FLEXIBLE ABRASIVE WHEELS



Designed for precision work where flexibility is required, these wheels are useful accessories for sanding and finishing regular and irregular jobs, penetrating into difficult recesses, lapping holes in dies, finishing various shapes of metal, wood, rubber and plastic parts.

Useful for finishing propellers in aircraft construction. Descriptive bulletin and sample wheel will be sent on request. Prompt Deliveries.

FIELD ABRASIVE SPECIALTY MFG. CO.

203 LOWE BLDG., DAYTON, OHIO

P. & W. "Backgrounds"

Our Country is waging its 6th war. The first 2 predated the machine age. The Civil War saw the beginning of mechanized warfare. Steam - powered locomotives, hauled troops; telegraphy served the signal corps; and steam-driven iron-clads, like the Monitor and the Merrimac, set a new tempo in naval warfare.

Back in New England, just about the time the Civil War got under way, Francis A. Pratt and Amos Whitney formed a partnership, developing and building automatic silk winders. They had barely started, when "war orders" began to rush in, according to the story in a beautifully illustrated booklet, "Backgrounds," just issued by Pratt & Whitney, Niles, Bement & Pond Division, Hartford, Conn., explaining the important role it is taking in America's all-out war effort.

Some Pratt & Whitney products of those days, when demands for precision first began to assume importance, were a miller, horizontal shaper and a lathe. They're still good-looking machines, today, say the makers, and repose in the Ford Museum . . . "unless they've been drafted for war duty."

The story goes on with interesting sidelights on the firm's contributions to our nation's war-production efforts in the Spanish-American, World War, and the present titanic struggle. It was during the fracas with Spain, says the narrative that the company's activities in armament proved their worth. The Lee Gun, forerunner of the famed Lee-Enfield, and father of bolt-action guns, came out of its shops at that time.

Experience in its normal, peacetime production equipped the company to serve admirably the nation's war effort in World War I when arsenal equipment on a scale previously undreamed-of, rolled from its lines.

The booklet, 9½x133/4", is replete with beautifully reproduced photographs, illustrative of present-day war activities, and the part Pratt & Whitney plays in them.

LOW TEMPERATURE CASTOLIN EUTECTIC ALLOYS

Salvage defective castings ave "hard-to-get" parts with this new welding development.

CASTOLIN binds without melting the base metal. This means high strength, matching color. It means less stresses, less warping, less preheating.

WELDS: Cast fron, Iron, Nickel, Steel, Aluminum, Bronze, Copper, Brass, Magnesium, etc.

EUTECTIC WELDING

ALLOYS, INC.

ourn about W-bling's Greatest Achievements on firm betterhood for 32-page book a Low Temperature Webling".

Etiminates Some Costly Tools

CASE HISTORY Number 4.

The adapters are clamped on a "V" block which is turn is mounted on a rotating table on a milling machine. A slotting tool ground to the exact dimension specified is fastend to the clapper box tool holder. Each spline is cut in a few minutes—after rotating to a new position—the operation is repeated until all of the splines are cut accurately, dimensioned and equally spaced. Breaching—the only alternative—would have involved the expense of a series of braches and bracking operations, because the splines step at the shoulder of the adapter. Use of the SLOTMASTER required no tooling expense and only one set-up.

ζ

S

S

e

s

e

e

0

e

r

SLOTMASTER can be used on milling machines and provides double duty facilities at a minimum cost. It requires but little time to change-over from one head to the other.. The stroke of the ram is adjustable from 0 to 4".. the speeds range from 50 to 250 s.p.m. The tool holder of the clapper box type, can be turned in any position.. All of the working parts are of tool steel heat treated and ground to close tolerances.. SLOT-MASTER comes complete with pulleys, motor, belt and mounting adaptable to round over-arm or flat-on-round-overarm milling machines.

Send for 4-page catalog and give the specifications of the milling machines that you wish to equip. Immediate deliveries on high priorities.

EXPERIMENTAL TOOL & DIE COMPANY

is installed, giving date of installation and age of the machine at the time of installation, if it chances to be a used one, together with anticipated depreciation rate.

There are some who write off depreciation on the average machine or piece of equipment at 10% a year. That would mean that a new machine is expected to have a useful and profitable life of ten While some vears. machines may go considerably be yond this, there are others that will be better discarded before that time.

Someone has said that a machine is obsolete just as soon as a better has been placed on the market. Ifthat statement is too strong, it may conservatively be said that so soon as a better machine comes into competition with the one you are operating. your profits will begin to diminish as a result of that

begin to diminish as a result of that competition. Therefore, the plate found on a machine indicating that it is ten years old should at least cause it to be challenged on its right to remain in use.

A great many things can happen in the span of ten years, and as a rule, a great many things do happen with reference to machine improvement.

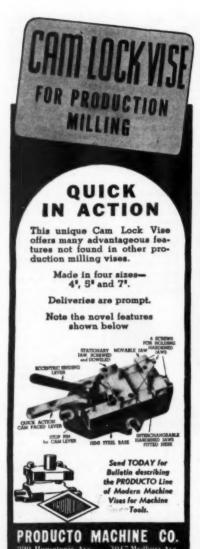
A well-studied approach to problems involving obsolescence of equipment is important to the successful operation of the modernday plant.



Machine Age

The present age has been called the machine age. But that is not exactly what is meant. Rather, the age of individual machines is meant. Machines have useful length of life, and at the end of that, should be replaced with others, which will do a better job, faster, and show better profit. From this comes the idea of furnishing one's self with a continual and gentle reminder, by the simple expedient of putting a plate on a machine when it

SEPTEMBER 1942



Binocular Eye-Shade

With conservation of vision sharply accentuated by the nation's fleeting war tempo, this device, designed for use by trades and professions having need for close inspection, sounds a new note in practical convenience, comfort and added efficiency.



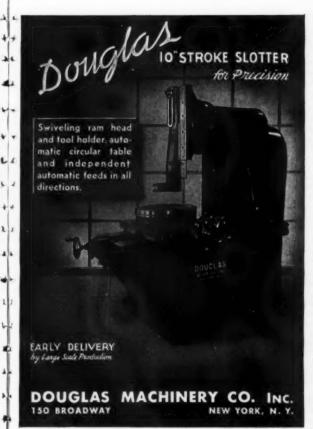
Magni-Focuser, as it is termed, is a scientifically designed optical device aimed to afford a maximum of comfort, freedom and visional aid, where magnification is necessary in production and inspection operations. In the durable, plastic headpiece are mounted lenses of high grade optical glass. Into each has been ground a prism to relieve eye-strain. Dual mounting brings objects under observation to needlepoint sharpness at distance approximately 10" from forehead.

Lenses are 5-power giving a magnification about 3 times actual size.

Claimed as an outstanding advantage of Magni-Focuser is that it aids wearer to see objects under considerable magnification as comfortably and normally as with vision unaided. Since, it is said, a true 3-dimensional view is impossible, using but 1 eye or "one-eyed loop," dual mounting of lenses, as in this instrument permits natural vision claimed for it.

The device is being used by many prominent firms and is available from N. L. Huebsch, 81 Yale St., East Willis-

ton, N. Y.



Stopping Magnesium Fires

Philip Carey Mfg. Co., Lockland, Cincinnati, Ohio, announces development of a product for reducing the losses incident to magnesium fires. It is called Carey MX Granules and listed by Underwriters' Laboratories, Inc.

Due to the vastly increased use of magnesium, especially in plants producing military material, magnesium fires and explosions have become relatively frequent. Owing to the

high temperature at which magnes i u m burns, around 3000° F, such fires are extremely hazardous, as well as entailing serious losses of the metal itself.

Extinguishing magnesium fires presents an unusual problem, since they cannot be dealt with as ordinary fires. Quoting a recent U. S. Bureau of Mines Bulletin:-"Application o f water, carbon tetrachloride. bon dioxide, foam and other common extinguishing agents on magnesium fires generally speeds up the rate of burning rather than stopping the fire; in fact in some cases, use of these agents may result in violent explosions or in the emission of hazardous gases."

It is claimed by the manufacturer that control of magnesium fires with MX Gran-

ule is simple and effective. The product is produced from non-critical materials. Tests are said to show that when spread over the fire, these granules soften, and seal the burning magnesium with an air-tight blanket, cutting off the oxygen supply and quickly extinguishing the fire. The same principle and methods apply also, and with equal effectiveness, to extinguishing magnesium incendiary bombs.

Claimed, also, for the new method is more metal saved after fires are out.

ly

ar

or

be

g-

on

aed

to

e- 1

gs

g-

ge

er

gly

is

ed

in

on

m

s-

942

n- 34

ny 4 4

Lake Erie Hydraulic Riveter

A new 10-ton Hydraulic Riveting Machine having 9' 10" clearance between tie rods for handling large work is announced by Lake Erie Engineering Corp., Buffalo, N. Y.

The entire machine is selfcontained with pumping unit including surge tank mounted on top. Upper and lower cross members are of webbed I-Beam construction for rigidity at all lateral points.

The riveter is mounted on the upper cross member and the anvil on the lower member. A manually operated valve controls pressure of

the riveting downward and return

strokes.

Distance between beams is 21½"; between tie rods, 9'10"; stroke is 3"; diameter of ram is 5"; Floor to top of tie rods, 4'½" and Overall length is 10'6".

Keystone Polishing Pads

Polishing Pads—a new product of the Keystone Carbon Co., St. Marys, Pa, have been developed for finishing the surface of cylinder walls. Use of these pads after grinding is claimed to remove all traces of abrasion, sharp edges and bent over particles and to create an inert finish on the cylinder wall which definitely eliminates premature piston and ring wear.

With production of new cars discontinued, the pads are said to be an important contribution to conservation



of present motors. They are furnished to fit standard sizes of grinders and hones and can be made into any size or shape.

Pacific Changes Name

Pacific Tool & Supply Co., 342 N. Vermont Ave., Los Angeles, Cal., announces change of firm name to Brand

E

SI

Tool & Supply Co.

Also available is literature on the firm's line of Tapping Machines, Boring Heads, Inside Micrometers, Telescope Gauges and Handy Knurler. The latter item is advanced as applicable to small, occasional knurling jobs by bringing knurls into contact with work and compressing a pair of plier-like handles. Also claimed for it is the value in knurling a wide range of diameters, capacity being from % to 2".



ADJUSTABLE HOLLOW MILLS

16 standard sizes—Cutting capacities 1/32" to 2". Also specials made to order.

The KUTMORE is the only hollow mill with builtin micrometer dial adjustment. Prompt delivery —even on specials. Write for Catalog No. 15. [625 Clinton Ave., N, Rochester, N. Y.

CARL WIRTH & SON, 1625 Clinton Ave., N,

mounication,



To get tomorrow's production today all machines building war material are pushed to their capacities. Many such plants are equipping vital machinery with McGILL "Solidend" MULTIROL Bearings to increase efficiency, carry the heavier loads and eliminate shut-down time losses.



BEARING DIVISION - 1700 North Lafayette

MANUFACTURING COMPANY, INC. VALPARAISO, INDIANA

Air Compressors

The location of the air compressor in the shop is important. The proposition of putting it in an out-of-the-way corner as a means of saving floor space should be condemned. If the compressor is located near to grinding machinery or in any other place where there is considerable abrasive dust in the air, it will be well to provide the compressor intake with a filter, to protect it against excessive wear. It is also well to have the air receiver tank

located in as cool a place available, so moisture in the air may be precipitated to the bottom of the tank, and that as little of this moisture as possible may be entrained in air lines leading from the tank.

Lubrication of your compressor is important. You will need an oil that will carbonize as little as possible. It should be fed carefully so that there will be no excess to carbonize on the valves. Air is heated by compression. If and when compressor valves are fouled with carbon so they do not close tightly, there is leakage of air from tank back thru the valves, and this is then re-compressed at the next p is ton stroke, building the heat higher and higher as the condition continues. Under this condition, the carbon in the valves actually becomes incan descent in some cases, and

ignites any oil vapor present. This is the usual root cause of air compressor explosions.

So watch your compressor lubrication as an important step in accident-prevention.

"Keep 'em Flying"
Buy U. S. War Savings
Bonds and Stamps



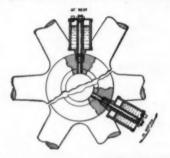
HART'S MILLING FIXTURES

These fixtures will make themselves popular and profitable in your shop. Easily kept clean to receive the work. May be used in either horizontal or vertical position. Suitable to hold round, hexagonal, octagonal, or square stock, aligning the work with the machine. Grip holds the work on the bottom as well as on the back. Shipped in pairs, unless otherwise ordered. Made in 4 sizes—¾ to 4*.

HART MACHINE CO. 26 MATHER ST., DORCHESTER, BOSTON, MASS.

Loose Pulley Oiler

For use on loose pulleys, idlers, clutches, eccentrics, and similar rotating machine parts, a new wick type lubricator is announced by Oil-Rite Corp., 3466 S. 13th St., Milwaukee, Wis.



The makers say it is designed to deliver a constant, positive, and regulated amount of filtered oil to shaft or bearing while pulley is in operation, and

BREMIL MFG. COMPANY
1700 Pitts. Ave., Erie, Pa.

ALL - ALLOY compound lever strap cutter. Cuts 1½ strap with one stroke

to prevent oil waste when pulley is idle. Reserve supply of oil is always visible.

Lubricator consists of a simple glass oil reservoir, mounted on a hollow metal stem. The stem is sealed from oil in the reservoir, except for 2 small ports at the very top. Inside stem is a cylindrical felt wick, which extends thru pulley hub to rest directly on shaft. A compression spring is wrapped around wick to hold it firmly in position against shaft.

As pulley rotates, and the lubricator with it, centrifugal force throws oil against top of reservoir, and into the two ports in stem. These admit oil to wick, which filters out dirt and sediment, and conducts oil directly to face of shaft.

The manufacturer points out that oil flow thru wick results partly from capillary attraction, and partly from suction caused by drag of wick on shaft. Introducing this latter principle, it is claimed, insures these 2 effects:—(1) positive lubrication while pulley is operating; (2) no drippage or oil waste when pulley is idle.

Amount of oil delivered to shaft or bearing is regulated by a small plug which controls area of oil ports. Reservoir is filled from top, quickly and easily. Five standard sizes are available—capacities from ½ to 2½ oz for standard tappings from ½ to ½".

Tappers

M&L Tappers, made by Brand Tool & Supply Co., 344 N. Vermont Ave., Size of Base Size of Jaw Height at highest point... 8x7 inches 3x6 inches 24 inches HART'S

DIVIDED MACHINE VISES



These Vises will hold work the full length of the table, if necessary. Useful on planer, milling machine, surface grinder or drill. They adapt themselves to any shape and can be used on sides of table as well as ends. The jaws are toolsteel and hardened, the angle holding the work down on the table.

HART MACHINE CO.

26 Mather St.,

Dorchester,

OOK. Boston, Mass.

When writing for descriptive circular kindly mention the BLUE BOOK,

Los Angeles, Cal. (formerly Pacific Tool & Supply Co., same address) originally furnished as table models, are now equipped with 36" high base with coolant system.

Announced also, are improvements on clutch and pulley, making it possible to tap holes up to ½" in chrome moly steels, and to ¾" in softer metals.

Taps are guided by precision leads so that class 3 and 4 specifications are said to be met on a pro-

be met on a production basis by even unskilled operators. The machines are equipped with dial indicators for bottom tapping. Performance records among prominent users, it is said, are highly satisfactory.

ers, it is said, are highly satisfactory.
Bulletin No. 142, issued by the firm, gives full details.

Acme Tool Catalog

Acme Tool Company, 200 Church St., N. Y., announces Catalog No. 42 now off the press. The heavy brochure, profusely illustrated, gives specifications, prices, etc. on a wide variety of precision production tools.

DOUBLE YOUR DRILL PRESS CAPACITY

Minutes are Seconds with the new TWISTITE Vise. Opens to full capacity in one second. Speed Defense Production with this New Vise.



J. A. Richards Co., Kalamazoo, Mich



PRECISION BENCH MILLER

Tapered Roller Bearings for high-speed production or precision tool room work. Tool direction adjustable to 60 degrees each side of center. —write for catalog—

DURO MACHINE TOOLS

Thompson Universal Milling Fixture



Index Poters titled at 30° milling and teath in Taper Reamer.



Pinters and Sass at right angles milling straight teath in cutter



Base of Fixture on 30° angle

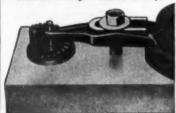
The Thompson Universal Milling Fixture featuring a 3-way circular swing, is a handy conversion attachment for performing milling jobs on any bench lathe. It is unusually versatile and provides for a wide variety of applications—the vise and universal slide can be used without index fixture for straight and angular milling. It is particularly effective in milling punches, end mills, keyways, "C" bores or in the manufacture of duplicate parts.

The illustration shows 3 typical jobs. In one of these, the index fixture is tilted at 30° milling end teeth in a taper reamer. In another, fixture and base are set at right angles, milling straight teeth in a cutter. In still another view, the base of fixture is set on a 30° angle, milling end teeth in a cutter.

The fixture is made by Auto-Ordnance Corp., 1437 Railroad Ave., Bridgeport, Conn.

REDUCE SET-UP TIME SPEED PRODUCTION

With K-O Adjustable U-Clamps



No. 4 U-Clamp with 3/4" boit-\$1.25. Discounts for quantities.

Turning step-elevation base quickly adjusts clamp to work height. Three-point contact assures uniform pressure, strong grip. Made in six sizes—three styles.

Write today for circular and prices.

K-O PRODUCTS CO.

BENTON HARBOR, MICHIGAN



ETCHERS and DEMAGNETIZERS

Let us tell you the many advantages of our new D. C. and A. C. models now available. Also, see our new line of Midget Chucks.

Send TODAY for latest circulars

PRINTZ ELECTRIC CO.

14595 KENTUCKY AVE.,
DETROIT, MICHIGAN



FLOATING HOLDERS for Screw Machines

Now Available for IMMEDIATE DELIVERY

(in Stock)

Our No.

40

B & S No. 00 - No. 1 B & S No. - No. 2

B & S No. No. 3

No. 4 B&S No. 8.65

Made of a new Special Alloy as developed by our Engineers (Designers and Builders of Fine Machine Tools)

MANUFACTURERS OF HALCO PRODUCTS 14230 BIRWOOD AVE.

Counter-Bore Depth

In handling multiple - spindle work, where it sometimes becomes important exactly to adjust the depth of a counter-bore, or where other similar operations require careful depth adjust- hand with the tool-holders and the ment, solution to the problem has often tools, to try out the setup each time been found thru use of special tool it is made. holders adjustable for length. Such adjustable - length tool - holders, fitted with graduated, knurled barrel, which may be turned clockwise to lengthen

the holder and make the cut deeper, or counterclockwise to shorten it and make the cut more shallow with reference to the machine stroke, will accommodate tools of different types, including c o r e drills, hollow-mills, etc., as well as counterbores.

Such tool-holders as made by some firms are highly accurate, and can readily be adjusted in thousandths of an inch and have been made in some cases to incorporate a range of length adjustment as great as 13/4 inches.

It is suggested, that in the use of such tool-holders. it is wise to segregate from the rest of the drills and tools, those partic-ular items of tools which are suitable for use with the toolholders, a n d keep tools and holders in a common group together, so they may be readily found as needed without trouble of looking thru a large assort-

ment of drills. It is further suggested. that in the case of counterbores which must be held within very close tolerances as to depth, that suitable gages for checking that depth be kept at

> Buy U. S. War Savings Bonds and Stamps

Lane-Wells Tool Holder Speeds Lathe Output



A simple and rugged engine lathe tool holder, said to cut tool changing time and greatly reduce operating time, has been developed by the Lane-Wells Co., Engineers and Manufacturers, 5610 S. Soto St., Los Angeles, Cal.

Known as the Lane-Wells Universal Tool Holder, the device consists of a tool post which can be fitted on to any engine lathe carriage, compound rest. Into a cylindrical member, clamped into the tool post, fit the detachable heads. Standard high speed tool bits used for boring, turning, threading, facing or

forming are fastened into the heads and each bit remains in place in the head. Drills and reamers can also be used.

In practice, the lathe operator has several heads each carrying a tool to perform a certain operation on the stock. The first head is placed in the tool holder and locked in place by a quarter-turn of the control handle. As soon as the operation on the stock is performed by the first tool, the operator releases the head, replaces it with the second head, locks it in place and is ready for the next operation. The change requires approximately 5 seconds.

If a particular tool must be removed and then reinserted in the toolholder. as for example when a particular working operation is interrupted by other work to be done, the original tool can be reinserted in the tool holder in exactly the same position it originally occupied. Work can then be resumed without the necessity of resetting position of the tool holder relative to the The ordinary engine lathe, I with the Universal Tool work. equipped with the Holder and a supply of detachable heads, makes possible any number of operations.

In actual practice during the past year in the Lane-Wells plant, in the manufacture of oil well supply parts, the Universal Tool Holder is said to have made possible a reduction of 35% in machining time on many operations.

Four sizes of the device fit all standard makes of engine lathes from 10" to 24".



STOP DUST

from All Kinds of GRINDERS with DUSTKOP

DUSTKOP collects dust from Surface, Tool and Precision grinders... Compact, self-contained... Operated by 1/4 hp continuous duty motor and fan ... Easily renewable, spun glass filters clean air ... LOW IN PRICE ... Immediate deliveries of standard units on high priorities.

AGET-DETROIT MFG. CO. 2042 Book Tower CAdillac 3090 Detroit * Write for Bulletin A-500



CAPACITY

(Automatic Chuck (round) 1". Swing over cross slide 6" Swing over bed 14"

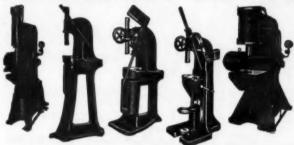
The MOREY 2G Finhen Searing Turret Lathe Insures today's high , the minute are traited bearing torrer terms market blody's high, appead production with a minimum of operating expanse. More well at less cost with these money sering features: Self-Lacking Terrer.

Vibraticaless precision with an infinite variety of spindle speeds for every job . . . Back Gears instantly thrown in through extra large Twin Disc Clutch . . . takes full advantage of high speed and car-

bide tools. Modern design for modern production. Can be furnished

MOREY MACHINERY CO.,

RAFT and



1883 GREENERD

The Originators of the Arbor Press

WORK IN REARMAMENT PRECISION

65 Standard Styles and Sizes. Manually operated presses 1/4 to 35 tons pressure. Motor driven hydraulic presses 11/2 to 30 tons pressure.

Let us send you our catalog No. F.

GREENERD ARBOR PRESSES

NASHUA

Est 1883

NEW HAMPSHIRE

Mechanics Through the Ages



To Meet Your Immediate Requirements For TURNING, FACING, BORING and REAMING JOBS

STANDARD Cemented-Carbide Tipped TOOLS

 Illustrated are the standard tools produced and stocked by Carbide Fabricators. Even and succeed by Carbide rapidcable Even under present conditions, our rapidly inunder present conditions, our repairy in-creasing production of these tools makes it possible for us to meet almost all delivery possible for us to meet summer all wellvery requirements. They are available for use in your present production -- when you need

The tools shown above will meet the majorive 15338 anown above will meet ine major-ily of your needs for turning, boring and facing operations. Types are available for cutting of non-ferrous materials, cast iron, bronze, etc., and also for steel cutting.

Carbide Fabricators' standard reamers meet innumerable requirements in present day production. Expansion reamers are absolutely positive in locking for size. They prointerly positive in locking for size. They provide maximum expansion of 1,930" in half inch reamer.) Their simple construction assures trouble-free service. Solid reamers and the provided to extraords. are held to extremely close tolerances, and manufacturing methods such as the hardenmenuscruring memous such as me nergen-ing of bodies to Rockwell 58C assure excep-

WRITE FOR COMPLETE CATALOGS LISTING tional durability. SIZES AND PRICES

We are authorized suppliers of Carboloy, Vascoloy-Barnet

and Firthite cemented carbides.



V Carbide Fabricators

ROYAL OAK

TO EXECUTIVES:

NOW YOU CAN HELP

Even More...

New Treasury Ruling Permits Purchases UP TO \$100,000 In Any Calendar Year of Series F and G WAR BONDS!

This is not a new Bond issue and not a new series of War Bonds. Thousands of individuals, corporations, labor unions, and other organizations have this year already purchased \$50,000 of Series F and 6 Bonds, the old limit. Under the new regulations, however, these Bond holders will be permitted to make additional purchases of \$50,000 in the remaining months of the year. The new limitation on holdings of \$100,000 in any one calendar year in either Series F or G, or in both series combined, is on the cost price; not on the maturity value.

on the cost price; not on the maturity value.

Series F and G Bonds are intended primarily for larger investors and may be registered in the names of fiduciaries, corporations, labor unions, and other groups, as well as

individuals.

The Series F Bond is a 12-year appreciation Bond, issued on a discount basis at 74 percent of maturity value. If held to maturity, 12 years from the date of issue, the Bond draws interest equivalent to 2.53 percent a year, computed on the purchase price, compounded semiannually. The Series G Bond is a 12-year current income Bond issued at par, and draws interest of 2.5 percent a year, paid semiannually by Treasury check.



SAVE WITH

War Savings Bonds

This Space is a Contribution to Victory by Hitchcock Publishing Co., 508 S. Dearborn St., Chicago, III.





MARK YOUR PARTS

Permanently

PART NUMBERS HEAT NUMBERS. CATALOG NUMBERS, SERIAL NUMBERS.

PATENT NUMBERS

MANUFACTURER-INSTRUCTION DATA-INSPECTION

Positive, Permanent marking on your products assist prospects to order. Makes it easier to buy—new, repeats and repairs. Gives you a delimite record of pertinent data on each part produced.

The Pneumatic marking machine illustrated is our HI-DUTY model 25 general purpose tool for short runs or production work. It operates from your shop air line and is one of numerous models built to produce neat, permanent markings quickly on metal fabrications.

We will be happy to make specific recommendations upon receipt of samples or prints of parts to be marked, showing approximate lettering, its location on the part, with required hourly production.

MARKED PARTS ADVERTISE
IN THE RIGHT PLACE, AT THE RIGHT TIME.

Send for complete catalog of our full line of marking Tools, Machinery and Equipment,

GEO. T. SCHMIDT, Inc.

1802 Belle Plaine Ave..

Chicago, III.



Why Not Buy The Original Electric Etcher MARK IRON AND STEEL THE ETCHOGRAPH WAY

New ELKONITE TIP pencil. New Baby Grand Model at a lower price.

2,000 in use

BREWSTER - SQUIRES CO.

42 Church St.,

New York, N. Y.

Two New "Di-Acro" Models





Two recently improved Di-Acro Models, viz., a new Bender, and a Brake of the No. 2 series, are offered by O'Neil-Irwin Mfg. Co., 314-8th Ave., Minneapolis, Minn.

From 8 to 10 changes and improvements are incorporated in each model including increased weight and extended mechanical strength limits, offering greater rigidity, stability, ease of operation and higher material output. Operating range and degree of universality are also broadened, providing many additional opportunities for economical forming and duplicating without time delay and preparation expense of special dies and die sets.

Greater contact surfaces are offered as well as additional provisions for quickly removing the surfaces for changes and alterations, necessary for a wide variety of forming without dies, Both of these units are said to be



LOSED

TRADE AUTO

CLOSED

Offset Type

CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET.

AUTO MOULDING & MFG. CO.

2326 S. CANAL ST

SPECIFICATIONS: Open Width % to 6* Gage Material .040 to .125 Pin Diameter .101 to % Lengths to 120*

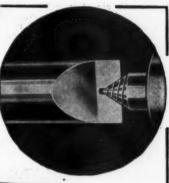
SEMI-OFFSET

CMD -- HELICAL GROOVE LATHE CENTER

When used with CMD Lathe Center Point Lubricants has an operating running

Ratio of from time over the conventional TYPE OF LATHE CENTER

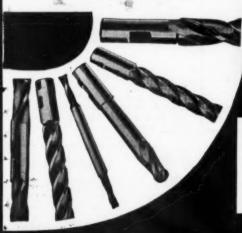
CMD Helical grove center exDepth Helical grove caused by centing tools - causys center
Werk and center - Lubricates of work and
center - Ne stopping of lath
to relubricate the center - Ne
readjustment of tail stock necessary
Ne dripping or crushing out lubricant - Frietlenal heats reduced
Expansion of work kept at a minimum.



Write for Oll sample and Bulletin TODAY

CHICAGO MANUFACTURING AND DISTRIBUTING CO.

1942 W. 46th ST., CHICAGO, ILLINOIS_



Shear Cut -High Speed

END MILLS

Shear Cut End Mills are offered in all standard sizes, single and double end.

Write for catalog and prices today.

PROGRESSIVE TOOL & CUTTER CO. 2345 WOLCOTT ST.,

FERNDALE, MICHIGAN

finding wide acception in War Production Industries, the No. 2 Bender, being well adapted for forming all types of round and irregular shaped tubes, as well as flat materials, required for Aircraft and Marine construction.

The No. 2 Brake, is also widely used for forming various types of special materials and synthetics as well as dielectrics and other substitutes, required in Instrument, Photographic, and Optical Manufacture.

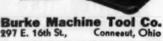
BURKE

MILLING MACHINES
Make Fast Work of Small John

Motor Driven

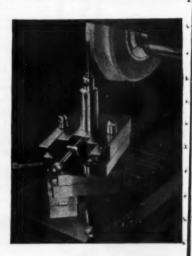
Timken roller or ball bearings to spindle

Write today for circulars.



Compound-Angle Dresser

The new Robertson Compound-Angle Wheel Dresser is a precision instrument recommended for use on all,
surface grinders. It is manufactured
by F. H. Robertson Co., Malden, Mass.



The makers claim this close-tolerance wheel dresser will dress included angles up to 180° at one setting; eliminating the old-fashioned "trial and error" method, thereby saving precious time, and money so necessary in our allout war production.

Rotary Files

These files are available in a number of different styles and sisse, in either High Carbon Steel or High Speed Steel.

Send for catalog showing a wide variety of standard shapes and special shapes. Perhaps we have what you want in stock, if not, we can grind it.

The Rotary File Co.



Hand Cut

If you have need for special shape Files, we shall be glad to submit the desired File for your approval and trial upon receipt of a sample or sketch.

This service is designed especially for your convenience, for which we make no charge.

STRATFORD, CONNECTICUT

ACME MONOCHROMATIC LIGHT

with ACME GLASS OPTICAL FLATS simplifies Micro-Inch Measurement

* Where light wave measurement is used to determine surface flatness, and where optical flats are used as comparators, light of a single wavelength is required.

INCREASES THE VALUE OF YOUR OPTICAL FLATS

The large bright working field of the Acme Monochromatic Light avoids the necessity of exact placement of the work, and makes inspection easy and fast. Interference bands can be seen on a relatively dull surface or through an appreciable air gap. This decreases scratching and wear of your glass flats as it is unnecessary to rub them together to squeeze out the air film.

For better, faster light-wave measurement, order the Acme Monochromatic Light today!





in-

red

ass.

nce

an-

or"

ime

ACME INDUSTRIAL COMPANY

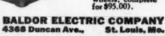
Makers of Hardened and Ground Precision Parts
210 N. Laffin St. Chicago, III. MONroe 4122



STURDY BUILT

for Long, Hard Service

BALDOR builds a complete line of Bench and Pedestal type grinders — 6* to 12* wheels. (At left, is special Carbide Tool Grinder, 6* wheels, complete for \$95.00).







ASK FOR

BULLETINS

Keep 'Em Running

BACK of the Keep Em Flying, Keep for the will to keep Em Running . . . referring to the vital machinery and tools on the nation's production line.

With tool conservation a major headache in many plants today, practical solution of the problems is vital to the

nation's war effort.

Said to be highly effective, due to an approach recognizing the psychological aspects of the problem, a complete plan for tool conservation is offered by Rotor Tool Co., 17325 Euclid Ave., Cleveland, O. and described by H. P. Bailey, President. Applied to maintenance and conservation of high-cycle electric and air pogtable tools, but adaptable to most others, it follows a 4-point program.

(1) Three-color poster, KEEP EM RUNNING, impresses upon executives and key men importance of the subject. Aided by excellent cartoons, gives pointers on tool-conservation and mainte-

nance.

(2) Booklet by same name as poster covers broad aspects discussed therein, more expansively, with details on repairing blades, bearings, etc. Booklet is designed to be given to the maintenance man.

- (3) Firm's service engineer takes this material to maintenance man, answers his questions and shows him how to do the job. (This phase of the program, says Mr. Bailey, is of prime importance in obtaining successful results.)
- (4) Detailed repair parts sheets, etc., such as provided by all makers of portable tools, are furnished to the maintenance man, enabling him to follow thru on his job. He should be equipped with necessary tools and instruments.

A vital feature . . . the psychologic aspect, says Mr. Bailey, and the one to which effectiveness of the plan is attributed, is for service engineers to impress upon maintenance men the importance of their positions, and the management's recognition of that fact.

Poster and booklets, first in the production tool field, according to Bailey, largely cover maintenance and conservation procedures applicable to tools made by the Rotor firm as well as competitive concerns, without partiality, making a worthy contribution toward solving one of the nation's forefront war-effort problems . . . tool conservation and maintenance.



These 3 cartoon figures are typical of the striking illustrations used on the 18x24" posters and in the 12-page booklet to emphasize the important service points—in a humorous vein that will be remembered.

Plants for Sub Contract Work

HERE are additional plants with machine tool capacity available for subcontract work. Code numbers are used in lieu of names for obvious reasons. Addresses are at all times available for Goverment Officials, prime contractors and responsible manufacturers.

Address all communications to Subcontract Dept., Hitchcock Publishing Co., 508 S. Dearborn St., Chicago, Ill. (Phone HARrison 6040).

If you have any idle tools in your plant, send a description of your plant and list of tools for listing. It is a patriotic duty for every plant to respond to Donald Nelson's appeal for additional subcontract capacity. There are no charges or obligations involved in connection with listing your sub-

contract facilities in The BLUE BOOK. It is our gratuitous contribution to help speed the American All-Out Victory Program:

H-48—Designers and builders of special machinery, tools and dies in New Jersey with facilities for pressed sheet metal, wire and screw machine products, have the following equipment available for subcontract work:—20 lathes, maximum capacity 24" swing x 24" overall; 28" swing x 10" overall; the rest vary to a minimum swing of 12":3" between centers, including 3 new bench lathes; 5 millers including Cincinnati plain No. 2, Cincinnati universal No. 3, Garvin universal No. 14;2. Becker-Brainerd plain, Bridgeport vertical turret head miller with attachments (alotting, etc.); 4 shapers—2 of 14" stroke, 1 each 15" and 16" strokes; 2 planers, Whitcomb 36" between ways, 28" clearance, 10" table, 22" between ways, 18" clearance, 10" table, 22" between for internal and external work; Dumore toolpost grinder with quills and attachments; Niles-Bement No. 346

SUB-CONTRACT WORK

MWANTED for any

TUBING

Such es —
Conduit, Hydraulic
and Pneumatic Lines
Shell Bands
Tubular Gun Mounts

Primer Tubes
Retractable Landing Gears

PRODUCTS OF SHEET METAL Such as — PRODUCTS

Such as —
Tank Parts — Chests
Work Benches — Tote Boxes
Ammunition Boxes — Shelving
Machine Tool Tenders
Drawer Cabinets — Ration Boxes

NO ITEM TOO LARGE OR TOO SMALL

Graduate Engineers on Our Staff for Design World

AURORA EQUIPMENT CO. AURORA, ILLINOIS



STOP WEAR—SAVE TIME ON GRINDING with Tamaloy Carbide Tipped Lathe and Grinding Centers



Circle Tip Tool Tamaloy Centers are equipped with a hard wear and gall resisting metal, lasting from 50 to 100 times as long as High Speed Steel.

STANDARD CENTERS

Morse	Taper Price Each	
No.	1	\$ 3.00
No.	2	5.00
No.	3	8.00
No.	4	12.00
No.	5	18.00

Write for catalog.

Prices on Brown & Sharpe, Jame and special centers on request.



horizontal boring mill—bores up to 8"—52" travel; Doall contour saw model ML; 15 drill press including new Delta 2-spindle and 2 radials with 3" arm; complete welding department; metal stamping department with 4 power presses equipped with automatic feeds; supplemental machine shop equipment including filling machines, power saws; full complement of precision measuring instruments to work to tolerances of .002". On order for August delivery, Carroll-Jamieson 18" geared head screw cutting engine lathe, 10" bed.

H45—Texas Service Parts Plant now engaged on some A-1-A work has some additional hours available on the following machines:—Landis 16 x 38" and 12 x 38" external cylindrical grinders (tolerance .0002"); Heald Model 50—18" spindle internal grinder (tolerance .0005") and Van Norman 8 x 24 external grinder (new-tolerance .0002"). No lathe facilities. Can do a real job on the equipment listed, and the management is eager to deliver.

H-44—Small manufacturing plant in Eastern Wisconsin has a 20" lathe; planer 24" x 96"; Miller 11 x 38"; 36" Shear (High Speed); Drill Press ½; 10" x 36" Norton Grinder; available for full time work, also gray iron foundry in connection.

H43—Extensive tube fabrication and sheet metal facilities in Chicago district are available for subcontract work. Plant is equipped to handle any bending, burring, flanging, forming, threading or tapping of tubing or rods. Fully equipped for such tubing products as primer tubes, shell bands, tubilar gun mounts, hydraulic and pneumatic lines, retractable landing gears, etc. Sheet metal equipment includes a complete line of brakes, presses, shears, welders, etc., handling from 10 to 24-gauge stock, for such products as ammunition boxes, airplane runways, ration boxes, tank parts, chests, machine tool tenders, work benches, tote boxes, shelf boxes,

H-42—Mafr. of precision screw machine and lathe products in New York area, sisses from 34 to 6" length and up to 16" diameter wants additional subcontract work. Is accustomed to working to tolerances of plus and minus. 0.005". Equipment includes 15 semi-automatic vertical Swiss-type chucking machines (1 year old): 10" Atlas bench lather Sloan & Chace bench lather; Seneca Fells 18" lather, B.6. S. No. 0 miller; Burke No. 4 milling machine; 10 Delita 10" drill presses; Delita abrasive cutoff machine; optical comparator and toles and attachments for machines listed. Equipment in excellent condition.

H-41—Auto Parts Company in Mississippi has a small precision machine shop suitable for subcontract work on jigs, fixtures and gages or other close tolerance parts. Equipment includes Norton external grinder 1872"; internal grinder 18" spindle; surface grinder 10x72"; 2½ universal milling machine with vertical attachment and dividing head; 3 lathes 11 to 18"; 2 portable boring bars 2½ to 7" and 7 to 24"; 24" drill press.

MULTIPLE THREAD-MILLING HOBS

· . . In any Thread System, Any Thread Angle, or Thread Form. Either Inch or Metric. Left or Right Hand Threads FREE OF DISTORTION.

In dimensions up to 7° O. D. and up to 4° Thread Length for INTERNAL or EXTERNAL THREADING.

Tolerances: for Thread Depths and Pitches less than 1/10,000 inch.

More than 25-years experience in the production of thread hobs.

DELIVERIES: approximately one week



U. S. MACHINE TOOL MFG. CORP., 100 South Sixth St.



Greenfield' CUTTER DREAMER AND UNIVERSAL TOOL GRINDER

The No. 3 Motor in Head Grinding Machine is ideally suited to the shop. Its heavy construction and rigidity make it a first class production machine on various types of work

It is capable of handling most all tool sharpening or tool room grinding, within its capacity. With it may be sharpened straight, taper or rose feamers, spur bevel, spiral, formed or ead milling cutters, taps, countersiaks or counterbores. It can be quickly set up for the accurate granding of straight or taper arbors, keys, gages and the edges, sades and the ends of list, square, hexagon or octagon bars. The holes in cutters, or other small internal work are easily handled

WRITE FOR ILLUSTRATED FOLDER

PRODUCTION MACHINE CO.=

GREENFIELD, MASS.

Speedy Pneumatic Air Vise

Planned to speed up production and cut time, labor and cost in defense plants, assembly lines and machine shops, a new foot-controlled air vise raises operating efficiency. Operated by compressed air, with a foot control, the new Speedy Air Vise leaves both hands free to work, facilitating production on drilling, tapping, light milling, punching, bending, straightening, staking, stamping and riveting. It is claimed that as many as 1200 operations per hour have been maintained with this vise.

The ram is driven by a long-life multiple type diaphragm instead of a piston. There is no packing gland or cross head, no friction loss, air leakage or need for constant lubrication! The movable jaw has a maximum travel of ½", gripping with an extreme force of 15 times air line pressure. A handy adjustment screw enables operator to set movable jaw anywhere up to its maximum opening of 3". Soft-steel jaw faces are provided, easily fitted with cavities to hold castings, screw machine parts, etc. Vise may be attached to an air line or to an individual compressor, and can be used on pressures up to 150 pounds psi. The Vise comes complete with air hose, foot controls, and fittings, ready for immediate use, and is reasonably priced. It is manufactured by W. R. Brown Corp., 5720 Armitage Ave., Chicago, Ill.



Tap Wall Chart

in many shops, current vital need of tool conservation is emphasizing proper reconditioning of taps to increase service life.

To facilitate correct reconditioning on Detroit Tap Reconditioners, a handy wall chart is now available giving details on recommended methods of sharpening various types of taps including taper, plug, bottoming and spiral pointed.

Issued by Detroit Tap and Tool Co., 8432 Butler St., Detroit, chart is printed on heavy card, eyeletted for hanging.

Instructions show correct number of threads to be ground for chamfering each tap type as well as the angle to which various tap chamfers should be ground.

SAVE EYES—SPEED WORK

This new Magni-Focuser Binocular Eye-Shade has dual-mounted lenness—ground from the finest optical glass—which magnify an object approximately three times its actual size to needle-point sharpness. This binocular design gives third-dimension vision—which is impossible with a "one-syed loop". Prisms in each lens relieve eye-strain, and the shade shuts out all glare. Fits over regular eye-glasses. Non-breakable, non-inflammable. Order one or more now for a 10-day trial. If you are not fully satisfied your money will be refunded. Price \$6.50, cash with order.

N. L. HUERSCH, SELLING AGENT, 81 YALE ST., E. WILLISTON, N.Y.



MAGNI-FOCUSER
Binocular Eye-Loop

tru-Cut

Tool Bits

Center Drills

• For steels tough to machine specify Tru-Cut Tool Bits. Five toughening treatments Rockwell "C" 65-66 not brittle.

Stocks for IMMEDIATE DELIVERY. Send for descriptive catalog and prices.



14236 Birwood Ave. Detroit, Michigan

New Britain UNIVERSAL VISE

Swivels 360 degrees horizontally, 100 degrees vertically, to give any angle or compound of



NEW BRITAIN TOOL & MFG. CO. NEW BRITAIN, CONN., U. S. A.

COLBORNE * Cathes Speed Lathes Speed Lathes Speed Lathes On Dies, Gears, Screws Long Rods, Shafts

For economical polishing, lapping or finishing of gears, shafts, dies, gages, ball races, long rods, etc.

Built to meet the requirements of those desiring a heavily constructed, smooth running machine of highest quality.

Has one H.P. built in motor with variable speed control, using REEVES standard pulley and belt.

Smooth automatic brake acts instantly when switch is thrown.

Collets or chuck may be used.

GOOD DELIVERY

Write today for details

Machinery builders since 1879.

COLROPNE MEG COMPANY

157 W. DIVISION ST., CHICAGO, ILL.

AUTOMATIC SAW SHARPENING ACCURATE QUICK



The NEW HOWE LINDSEY AUTOMATIC SAW AND CUTTER SHARPERER will solvage your worn flack-Rand metal skiting Sawa—Cercular Sours and Harrow Milling Cutters and sharpon then like NEW.

A NEW TWIST DRILL GRINDER



Inexperienced operators can sharpen drills quickly and accurately on the NEW— HOWE TWIST DRILL GRINDER

HOWE & SON, INC. HINSDALE, N. H.

Danits Heads M.D.N.A.



Samuel Danits of Donberg & Danits, Chicago Machinery Dealers, was recently elected President of the Machinery Dealers' National Association.

New Diamond Tool for Shot Forms

A new diamond tool, said to embody a new principle of wheel dressing has been developed for use on shot, shell and projectile forms by the Wheel Trueing Tool Co., 3216 W. Davison St., Detroit. Known as the Tru-Line tool, it is especially effective in reproducing the required form whether it be straight, radial, or step. In one in-stance cited, where 37 mm shot were being ground, production between dressings was increased 100% and only .002" was removed from the wheel during the redressing. Formerly .008 to .012" was removed.

By placing 2 or more diamonds in each tool, with each diamond cutting in the same track, the Tru-Line tool is claimed to eliminate the delays and defects incidental to using some other types of diamond tools. It is asserted that as the Tru-Line diamonds always point to the wheel center; their position nevers changes and the tool needs no resetting, turning or changing until the diamonds are completely used.

Production time cut from 24 HOURS to

with "HARDSTEEL" DRILL

"With a "HARDSTEEL" drill we now countersink more spring tempered steel trowel blades in two hours time than by former high speed steel countersinks in three 8-hour days—a saving of \$12.10 in wages alone while the operator has 22 hours left to do other work", writes Otto Heydrich, tool maker.

You, too, can drill, countersink, counterbore and ream hardened steels, hardened parts, dies, armor plate and other materials—Rockwell "C" 40 and harder—and do it faster, better, and cheaper with "HARDSTEEL".

New shop practice is: — harden first — then drill — to avoid misalignment of holes at assembly caused by heat treat distortion.

You harden it — we'll drill it with "HARDSTEEL"

BLACK DRILL CO., 5005 EUCLID AVE., CLEVELAND, OHIO

REAMERS . TOOL BITS

Silver Replaces Babbitt

Silver lined bearings are now used effectively in aircraft engines of radial air-cooled type and also in engines designed for liquid cooling, according to information recently released by the American Silver Producers' Research Project. Some are complete rings coated inside and outside with silver. Some are split and coated on inside surface only. Silver is understood to carry a higher load than babbitt, be a better conductor of heat and retain hardness at temperatures above those feasible

for babbitt metal.

As far as known, coatings are applied b y electroplating, altho it is possible that other methods of application have been found suita-Before application, the silver is understood to be machined to hold the close limits on dimensions required in aircraft work. Silver removed in machining, and that applied on bearings damaged in process or rejected for minor defects, is easily reclaimed. Coatings on bearings in service are believed to be pure silver which, has high corrosion resistance and is not attacked by corrosive agents sometimes found in lubricating oils. In this respect, the bearings are quite different from those made of cadmium alloyed with small parts of silver, and should not be confused with such al-

Altho silver coatings applied to bearings are under-

stood to be about as thick as those of babbitt previously used, most silver coatings applied to metals for industrial and other uses are well under 0.001" thick and are low in cost because quantity of silver used is small and readily applied by plating and other means. New ones for such coatings are being found and are expected to multiply as their excellent properties for industrial applications become more widely known and more generally accepted, in their field. Doubtlessly, many more will be developed.



For Jigborers, Boring Mills, Milling Machines. It fits all popular indicators. The above illustration shown complete with extension bar.

NO more tiresome tapping your indicator into position. Now—after locking to approximate position, you obtain final setting by simply turning Micro Adjusting Screw. This exclusive, time-saving feature of the OSLUND HOLDER for all popular indicators gives you complete control. Write today for details.



South Bend 16" Precision Lathes

Catalog No. 16, describing South Bend 16" Precision Lathes, has just been issued by the manufacturer.



This 8-page, file-size catalog completely illustrates and describes South Bend 16" Toolroom Lathes and 16" Quick Change Gear Lathes. Attachments, accessories and tools for use with these lathes are also listed.

Construction features of the lathes are illustrated. Specifications are tabulated for ready reference. These lathes have 16¼" swing, 1" collet capacity, and are made in several bed lengths providing between - centers capacities from 33½" to 105½".



HAWTHORNE, CALIFORNI



AMAZING NEW STICKER STOPS ERRORS

Simply press on—no moisture necessary—adhere to any smooth surface—never pop off, even when exposed to intense heat or cold—yet peeled off easily in one piece without leaving a mark. Won't pull off like string tags, fall off like wet stickers, rub off like cholk marks, pull out like pins, increase costs like metal tags. These new Kum-Kleen Dry Stickers are speeding production, eliminating errors, providing greater economy. Available in assorted sizes, shapes and colors—

blank or printed.

Write today for free samples—make your own on-thejob test, or consult our Engineering Advisory Service.

Avery Adhesive Dept. HH-9 Kum Kleen
451 E. 3rd. St., Los Angeles

STICKERS

Lead Alloy Bearings

American ingenuity is finding a way to meet the tin shortage as it threatens one of the most important applications of this highly strategic metal.

Engineers believe they have now found ways to produce alloys of lead to take the place of tin alloys in bearings.

One of the most gruelling trials of new lead alloys for bearings is being conducted at Cooper-Bessemer Corp., Mt. Vernon, O., Ralph Boyer, chief engineer, disclosed recently. The firm is prominent among the country's producers of Diesel, gas engines and air compressors vital to the war effort.

Alloys with lead as the base metal have been put into bearings of their Diesel engines and a ir compressors, and from all indications they are doing very well, the engineer said.

About a year of testing will be required, however, to prove conclusively that lead is an adequate substitute.

Importance of tin as a strategic metal is brought o ut by the fact that bearings in every automobile being driven in the U. S. contain on an average about 7½ lbs of this metal

Composition of the lead base alloys is being kept a carefully guarded secret. It varies somewhat with different industries.

They must duplicate, as nearly as possible, the desirable qualities of tin as a base metal.

The most critical test that could be put to a new bearing alloy is its use in an internal combustion engine such as a heavy duty Diesel. It must stand up under high temperatures and pressures.

Bearings such as these would afford welcome relief in the present shortage of tin, and may be the answer.

ACCURACY BEGINS AT THE BASE



demands extreme accuracy.

Standard Size No. 100A (base 6*x9*, average height 2¾*, top section 4*x4¾*) will fit most requirements.

Extra large base & screw assures permanent accuracy. Angular faces are finished.

SPECIAL SIZES SUPPLIED ON REQUEST

IMMEDIATE DELIVERY

JURZEK MACHINE AND ENGINEERING COMPANY

2305 Hilton Rd., Ferndale, Mich.

Multi-Speed Grinder

With economy of operation a big factor in war production, Standard Electrical Tool Co., 1954 W. 8th St., Cincinnati, O., has added to its line this multi-speed grinder which has received excellent acceptance in industries using electrical grinders.



Not only has it speed-change construction but the added advantage of accommodating wheel stubs from larger machines which were formerly discarded, providing additional wheel economy.

As illustrated, it permits wear of a 12" diam wheel to 5" maintaining the peripheral speed thruout life of wheel. Ball-bearing, totally enclosed motor is mounted on adjustable plate on back of pedestal, with power transmitted to the grinding spindle thru a multiple V-belt drive.

Safety guards are hinge door type, each with exhaust outlet, adjustable spark breaker, and work rest, all constructed in accordance with American engineering standards.

Interlocking arrangement prevents overspreading of grinding wheels. Other multi-speed grinders are available for vitrified or high speed wheels up to 30" diam.

The tor

new

Andr

ican

port.

clear.

ous f

The



LONGER LIFE for CENTERS when HARD FACED with



COLMONOY faced centers last from 3 to 5 times as long as centers of high speed steel. The unground centers pictured here—unretouched—have been coated with COLMONOY No. 6. Note the uniformity of these oxy-acetylene welding applications. The extremely high wear resistance of the hard surface of COLMONOY overlays will protect all vital wearing parts in the machine tool industry. Mild steel parts coated with COLMONOY alloys wear from 3 to 10 times as long as new parts made of high alloy steel.

WRITE TODAY

Learn about COLMONOY and what it is doing to conserve vital metals.

WALL - COLMONOY CORP.
720 Fisher Bidg.,
BEANGI OFFICES AT NEW YORK CITY, BLASDELL, N. Y. CHICAGO, TULSA,
WHITTER, CALIFORNIA, OTHER BEANCHES IN CAMADA.





For VICTORY

Buy United States War Savings

BONDS and Stamps



COLMONOY Hard Surfacing Alloys and Overlay Metals

"Keep 'em Cutting"

The Campbell Model No. 425 Cutalator Abrasive Cutting Machine is described in an interesting manner in a new 8-page booklet recently issued by Andrew C. Campbell Division, American Chain and Cable Co., Inc., Bridgeport. Conn.

The booklet brings out, by means of clear, crisp line illustrations, the various features of the machine, the cycle

of simplified operation, and illustrates the different shapes and types of the materials that can be handled on the Cutalator.

Wheel Dressing Tools

A new folder on Willey's Diamond Wheel Dressing Tools, gives sizes, specifications and prices. It is issued by Willey's Carbide Tool Co., 1344 W. Vernor Highway, Detroit, Mich.



The No. 2C Surface Grinder will grind work 18° long, 6° wide and 11° high using a wheel 7° in diameter.

High-grade heat treated chrome molybdenum steel spindles hardend and ground.

Work Table 51st long 8st wide with a working surface 18st by 6st and three T slots ½st wide.

Spindle requires a 1 H.P. Motor, 1800 R.P.M. which is entirely enclosed in the base.

Exclusive Selling Agents.

H. LEACH
MACHINERY CO.
38° Charles St. Providence, R. I.

Variable Speed Lathes with Sjogren Chuck

For finishing, burring, filing, apping or polishing; a new Ideal Speed Lathe is especially designed to increase the output of finished screw machined parts up to 13%" in diameter. The Sjogren Chuck operates a spring type collet which is quickly adjusted to the size of the work by means of a hand wheel mounted on the chuck. The hand wheel is deeply grooved for quick, easy opening and closing of the collet.



The machine is similar to the Schauer Standard Variable Speed Lathes. Motor speeds as low as 20 rpm ranging up to 4,000 rpm are available. The speeds are in ratio of 6 to 1 for single speed motors and 12 to 1 for two speed motors. Variation in spindle speeds is obtained by movement of a variable pitch pulley controlled by a conveniently located ball crank.

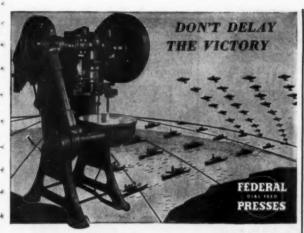
Motor is spring mounted in base of pedestal and automatically controls belt tension. The motor and brake controls are hand operated. Manufactured by Schauer Machine Co., 2064 Reading Road, Cincinnati, Ohio. is

n

ton

d

d



SPEED PRESS OPERATIONS WITH FEDERAL DIAL FEEDS

DON'T let incompetent press equipment delay victory! Speed up many operations 3 to 6 times by using Federal precision-built presses with multiple dial feeds. Positive indexing and locking mechanism smooths out action of dial — permitting unusually rapid production with exceptional accuracy and safety to the operator. Easily indexed to any part of the crankshaft revolution from 98° to 188°, giving long or short dwell of the dial. Cannot akip or coast by stations. Avail-

able in eight sizes of Federal Presses. Write for facts today.

THE FEDERAL PRESS CO. 809 Division St., Elkhart, Indiana.

Many Federal Models

Federal Open-Back, Inclinable Presses are available in size sizes, with capacities ranging from six to 80 tons—either flywheel or geared type. They represent the culmination of Federal's 40 years' intensive experience in press building. so the blast reaches only parts of the product revealed thru the stencil. Rubber stencils are used.

There is also the proposition of marking rough steel stock. In some cases it is necessary to mark on forgings, castings and other hot metal items. For these purposes, many times the ordinary crayon will not do and soapstone will not answer. As a result many have turned to the use of a marking paint of special type, furnished in stick form, which, may be carried in the pocket. This paint is furnished in 2 forms: one for hot marking and the other for cold.

It will not wash off on exposure to weather.

Marking

While many machines and devices have been developed for marking finished metal surfaces, out-of-the-ordinary marking problems arise from time to time which require out-of-the-ordinary solutions. The sand blast is one device used in a measure for marking different items, particularly when marking is of a decorative nature. The idea in sandblast marking, as a general rule, is to sandblast over a stencil,

The type used for hot marking may be used on material as hot as 1200F. without running. Hot marking material comes in either white or yellow, while that used for cold marking comes in four or five different colors. One suggested use in the matter of large machine castings, is to mark them serially, so they may be drawn from storage and machined in approximate order of their casting. This gives all of them equal time for seasoning.

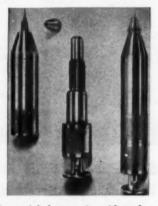


TRINDL PRODUCTS, Ltd.

Welding Equipment and Supplies
2227-E Calumet Ave., Chicago, III.

Needle Point Plumb Bob

Adaptable to armament and jig installations, as well as to operations where precision aligning is necessary, a Precision Plumb Bob is announced by Aero Tool Co., 233 West Olive Ave., Burbank, Cal.



A special feature is said to be the novel use of phonograph needles, assuring a true and constantly sharp point at practically no replacement cost. The needle is held by a watchmaker's pin chuck at indicating end. Hole for the suspension wire is held to exact size and is centered with indicating point. Upper part of the Bob is threaded into lower. Three bearing surfaces between these parts hold them concentric. Thus, by simply rotating one part upon the other it is possible to raise or lower the indicating point (phonograph needle) over 1/2 without losing concentricity. This adjustment feature is said to be particularly important in aligning gunsights » and other armament installations.

According to the manufacturer, the low price of the Bob removes the cost barrier formerly preventing widespread use of such precision.

"Keep 'em Flying"
Buy U. S. War Savings
Bonds and Stamps



GET YOUR ANSWER AT America's War Conference on Metals!

War has developed new products, new production equipment and new ideas. All of these aids to greater production will be shared when the metal industry meets for the 24th year at the National Metal Congress and a War Production Edition of the National Metal Exposition, the week of October 12, in Cleveland.

Here is your opportunity to discuss your problems with other leaders in the industry. It is your opportunity to see what war metals are adaptable to your production, to study the best in equipment and supplies, to learn how other plants are meeting their war problems.

This is your opportunity—and your responsibility—to help your industry carry forward its giant task of winning this war of metals. You may listen to as many as 100 technical papers presented by the four great cooperating societies. You may attend the numerous war production conferences. You may consult with manufacturers' experts in more than 230 educational displays. Plan to attend this great war conference on metals.

Display Space Still Available—more than 230 manufacturers have reserved 89% of the display space available in this 100% educational meeting If you serve the metal industry, reserve your space now and put your technical experience and information on the war production line, where it will do the most good today.

TIME

OCTOBER 12 TO 16,

PLACE

CLEVELAND'S

EVENT

THE NATIONAL METAL
CONGRESS AND
WAR PRODUCTION EDITION
NATIONAL METAL
EXPOSITION

THEME

OF WAR PRODUCTS

5-Station Lathe Turrets By Automatic

Oscillating Tool Block
Lathe Turrets with 5
stations and 10 settings,
are detailed in a new
bulletin just issued by
Automatic Machine &
Tool Co., 132 Charles
Street, Auburndale,
Macs.

The turrets, according to the firm, are specially designed with features aimed to give to pieces requiring multiple operations, superior finish and workmanship at stepped-up pro-

duction rates. In addition to giving all data and information on 3 sizes of heads available, bulletin illustrates examples of precision, multi-operational work turned out on ordinary lathes equipped with the heads.

Ten-step index plates allow 10 settings of different tools. Extra large diameters of index plates are claimed to



afford unusual rigidity of boring-bars and tool-bits. Center-posts are also extra heavy, provided with lock nut and flattened to allow for solid connection to top of compound. Turret head bodies are of semi steel, accurately machined and said to be ample in strength for broader availability and longer life.

Five sets of tool holders are furnished with each head.

Ajax-Hultgren Catalog

Heat treating in Ajax-Hultgren Electric Salt Bath Furnaces is explained fully in catalog No. 107A, just issued by Ajax Electric Co., Frankford & Delaware Aves., Philadelphia, Pa. The work has 20 pages completely illustrated, showing modern installations of the immersed electrode electric salt bath furnaces with self-circulating, selfheating features for all key heat-treat-Discussed are operating principles, showing standard sizes, together with variety of covers, pots, fume chimneys, as well as manual types in general use, taken, the company says, from more than 1,000 installations.

Welding Positioner Bulletin

An interesting well illustrated bulletin describing the new practice of welding on positioners is announced by Cullen-Friestedt Co., 1321 S. Kilbourn Ave., Chicago. This bulletin WP 22 presents 16 pages of typical welding jobs with full descriptions of position welding methods.



THE TANNEWITZ WORKS

GRAND RAPIDS, MICHIGAN

(

c

. 0

I

ì

C

FI



Prompt Deliveries on High Priorities

Collect Grinder DUST DUSTKOP!

Pulls dust away from grinding wheels and returns cleaned air to room. Complete self-contained dust-collecting system.

DUSTKOP is operated by GE 1/4 hp, continuous duty motor, driving multiple-blade fan. Compact. portable, low-priced.

AGET-DETROIT MFG. CO.

Write for Bulletin



DEARBORN Automatic Chucking and Indexing Fixture MILLS OVER 1000 PARTS PER HOUR

Work held by draw in collets. Collets open and close automatically. Work automatically ejected. Indexes without loss of time for milling 1, 2, 3, 4, 3, 8, 12 or 24 sided pieces. Minimum set-up time required. Speeds up production. Positive and accurate in operation.

J. W. DEARBORN 72 S. CLIFF ST. ANSONIA, CONN.

Gibsiloy Contacts

Gibsiloy contacts, made by Gibson Electric Co., Pittsburgh, Pa., are now available in laminated metals in which Gibsiloy materials and base metals are combined to obtain the best features of each. Gibsiloy is used as a facing on contact surfaces where its electrical properties are used to best advantage, and inexpensive base metal is used for backing material, which results in lower contact costs and conservation of vital metals. The contacts are produced by

Lewis Semi-Finished BENCH MILL A PRECISION MILL AT A SENSIBLE PRICE!

Ideal for many uses. All major machining operations finished to high degree of accuracy. Perfectly designed, shop-tested, trouble-proof construction. Exceptionally efficient. Stands se-



verest service. Handles full range milling work. Table 37% *218*, travel 12*, cross feed 5½*, vertical 7*, No. 3 Morse Taper in spindle. 36* center hole adaptable for collect attachment. Completement. Completement of the service of

Sand today for new 1942 Catalog.

LEWIS MACHINE TOOL COMPANY

P.O. Box 116, Sta. A, Dept. Z-21

Los Angeles, Cal.

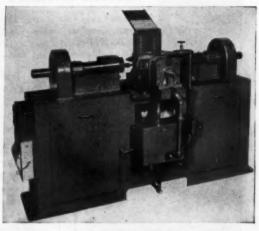
special processing of metal powders which do not naturally alloy with one another. The company has pioneered in the development of hitherto unused combinations of metals to produce new and improved types of contact materials to meet the needs of the electrical industry for contacts suited to many diversified types of electrical apparatus.

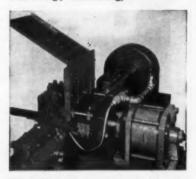
They are available in both inlay and overlay types, and furnished with Gibsiloy or with fine silver or other precious metal contact surfaces for a wide variety of contact applications.

Pines Profiler Uses Automatic Feed

Pines Engineering Co. Inc., 600 Prairie St., Aurora, Ill., announces addition of an automatic chute feed to the air chuck on their 2-spindle profiling machine. This attachment is being used for feeding such items as brass and copper primer tules for boring and tappi g operations on both ands at the same time. According to the manufacturer, production from these machines has been increased as much as 30 percent by the addition of this automatic feed.

Pines Profilers are being employed in defense production for burring, chamfering,





facing, threading, centering, reaming and boring both ends of tubes or rods simultaneously for such important war items as bombs, tank tread tubes and pins, etc. Several of these profiling operations may be combined and performed at the same time, thus greatly increasing productive output and decreasing man hours.

Power Boat Saves Rubber

An ingenious means of conserving rubber to carry on the nation's war effort has been adopted by Sheldon M. Booth, owner of the Diamond Tool Company. The company has taken over a large power cruiser to transport its tooling engineers and supplies between the defense plants it serves in the Great Lakes district.

The company serves many of the steel mills and precision defense plants in the New York, Pittsburgh, Detroit and Minneapolis areas, as well as others thruout the country. Its engineers supervise and instruct employees in the use of tools and operation of machines.

Elastic Stop Nut Wall Chart

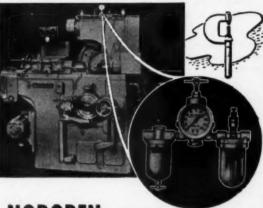
A wall chart, explaining uses of its various types of self-locking nuts, is being distributed by Elastic Stop Nut Corp., Union, N. J., to engineering departments, drafting rooms and maintenance shops.

The chart measures 21x27" and is reinforced top and bottom by metal strips, with an eyelet for hanging.

"Keep 'em Flying"
Buy U. S. War Savings
Bonds and Stamps

PRECISION-

Norgren Lubricators lick wear and corrosion in the wheel spindle of famed Jones-Lamson Automatic Internal Thread Grinders.



NORGREN LUBRO-CONTROL UNITS

Over 70,000 Norgren Units help keep production throttles wide open! Vital on air chucks, air cylinders, high speed spindle bearing assemblies... all air actuated tools and mechanisms.

Catalog 400

C. A. NORGREN CO. 220 Santa Fe Denver, Colo.

Electronic Speed Cop

The science of electronics may now supply the answer to the speeding motorist who tells the judge he did not know how fast he was going, according to Frazier Hunt, G-E newscaster.

"Driving at night along a highway near St. Paul and Minneapolis (Minn.), the motorist's attention is caught by the sudden turning on of a large illuminated signboard ahead of him. A second or two later the sign flashes the speed of his car in lighted numbers big enough to be seen clearly by

the driver. The sign also warns him of a danger spot ahead and ample warning is thus given to permit him to bring his car to a safe speed before reaching this road junction.

"Startled by this electronic speed cop that issues no summonses. the motorist may wonder what mathematical genius is hiding behind the sign. The explanation is simple. As his car passes a certain point on the highway it inter-rupts a beam of invisible rays. A photoelectric relay turns on the sign, and starts an electronic timer which measures the car's speed. As the car passes a second electric eye the timer calculates the speed, and flashes the speed in lights, as a warning to the driver.

"Electrons, traveling with the speed of light, get the message on the signboard in plenty of time to warn the

fastest driver. There is nothing to be gained by arguing with speed shown on the sign. To an electron, one-millionth of a second is a long time.

"This application of G-E electronic devices is but another example of helpful, public services which they can perform."

Already, they are used to open doors, turn lights on or off, and do numerous other robot tasks, with the number of uses rapidly increasing.

BLUE BOOK BUYERS' SERVICE

Available To Our Readers

If you will list below the metal-working machines or machine shop equipment in which you are interested and mail to us, we shall be glad to refer your needs to the manufacturers or companies in position to serve you. Replies will come from them—not from us.

If you have any special engineering or shop problem with which you are experiencing difficulty, suggest that you send us full details for reference to our Engineering Service Department.

We are in the market for	
*	

ime	······································
ldress	
ease check-	
Interested in new equipment.	
Interested only in used equipment.	
Mail to the	

Mail to the HITCHCOCK PUBLISHING CO. 508 South Dearborn Street, Chicago, III.

Classified Section

USED AND REBUILT MACHINERY

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of \$5.00 for your name and address and a five line advertisement. For additional lines, 45e per line.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, Chicago, making known your wants on either new or used machinery and the publisher will gladly pass them along to the advertisers.

FOR SALE BY

Aaron Machinery Co.,

Automatic screw machines, Cleveland, Model A, 13". automatic screw machines, Cleveland, Model A, 12", 4" 12", 2".
Boring mill, Bullard 38" vtl., 2 heads, 42".
Boring mill, Bullard 38" vtl., 2 heads, 42".
Boring mill, Bullard 38" vtl., 2 heads, 42".
Boring mill, Bullard 38" vtl., 2 heads, M.d.
Eyeletting machines, Gorton, pantograph, all sisses.
Eyeletting machines, United Shoe, Model B.
Flauger, McCabe ".
Gear hobers, Mr. Gleason, bevel. (2).
Gear hobbers, G. & E., S. & S., Barber-Colman, No. 2.
Gear abaper, Fellows No. 6.
Grinder, Churchill Morgan internal.
Grinder, Churchill Morgan internal.
Grinder, H. Andis, m.d. 18v5".
Grinder, H. Jandis, m.d. 18v5".
Grinder, B. & S., planer type surface.
Grinder, B. & S., planer type surface.
Grinder, Norton 16"360.
Grinder, M. Modern, m. d., 12:34", 12x42".

4

Grinders, Norton 18"x80.
Grinders, Modern, m. d., 12x34", 12x42".
Grinder, Landis 20x72" plain cyl.
Hammers, Pettingell trip, No. 1, 2.
Index filing machines, Oliver.
Keyseaters, Baker No. 9, du.ck change.
Lathe, 15x8, 15x8, 12x10", quick change.
Lathe, 24x19 Reed-Prentice, grd. head, m.d.

176 Lafayette St., New York, N. Y.

176 Lafayette St., New York, N. Y.
Lathe, 24"x26" Fay & Scott, 3 step.
Lathe, McCabe 26-46"x14".
Lathe, 48"x26" Nies grd. face plate dr.
Miller, Cincinatti No. 4, Universal.
Miller, thread, Lees Bradner No. 4.
Milling machine, Robottom Cam.
Pipe machines, Oster, Williams, 2", 4", 6", 5", m.d.
Planer, 3244"x6" Wintcomb, 2 head.
Planer, 3244"x6" Wintcomb, 2 head.
Planer, 3244"x6" Wintcomb, 2 head.
Planer, 3242"x10" Pond, 1 head.
Planer, 32423"x10" Pond, 1 head.
Planer, 3242"x10" Pond, 1 head.

Globe Machinery Co.

602 W. Lake St., - - Chicago, Ill.

Boring Mill: Niles 48" vertical car wheel boring &

Davis Machinery Company 1-3-5 St. Clair St. Toledo, Ohio

1-3-5 St. Clair St.

Drill, & spindle Avey h. s. b. b.
Drill, No. 1 SS Garvin (Natco) duplex,
Gear cutter, 48" x12" Gould & Eberhardt, s.p.d.
Gear shaper, No. 6 Feellows, arr. for m.d.
Grinder, No. 6 Realy, dbl. spdl., disc.
Grinder, No. 28 Brown, & Sharpe int. of b.
Grinder, No. 28 Brown, & Sharpe int. of b.
Grinder, No. 1 Manville, sgl., stroke, solid die.
Keyeseter, No. 2 Mitts & Merrill, b.d.
Lathe, 32" x26" Gleason, st. c. gear.
Milling machine, No. 2 Cincinnati, in power, s.p.d.
Milling machine, No. 1 Cincinnati, universal, m. d.
Press, No. 90-D Toledo, dbl. crank, m.d.
Punch, Long & Allstater multiple.
Shaper, 20" Gould & Eberhardt, b. d.
Turret lathe, 32" x14" Jones & Lamson, gd. hd., s.p.d.
Turret lathe, No. 1-B Foster universal, gd. hd., s.p.d.
Turret lathe, No. 1-B Foster universal, gd. hd., s.p.d.

USED AND REBUILT MACHINERY

FOR SALE BY

Foster Machinery Co. 3982 Bluestone Rd. Cleveland, O.

Forging roll, No. O.C. Ajaz. Punch, EF Cleveland, 24" throat, 14" cap. Saw, 6" Newton, cold.

B. W. Matson Machinery Sales 610 W. Michigan St., Milwaukee, Wis.

Balancing machine, Olson crankshaft.
Boring machine, 9 spindle turret type m.d.
Broach, oil gear, XA3 m.d..
Centering machines, belt drive, 5".
Crane, caterpillar 18 ton Link Belt K 2 elect. drive.
Dynamometer, Sprague, 50 h.p. 1599-2500 rpm.
Hammers, Bradley Aleye, 56-75-160 lb.

The Elyria Belting & Machinery Co. Elyria - - Ohio

Drill, Moline, hole hog, 3-spdl. Drill, No.3 Foote-Burt, rail, DG-4. Grinder, Brown-Sharpe, plain cylindrical with awivel table - belt drive. Grinder, Norton universal.

Wm. C. Johnson & Sons Machinery Co. 2111 Hadley St. St. Louis, Mo.

Boring machine, 4" bar Binsee.
Drills, 18" H. S. Sipp. (2)
Grinder, Oliver twist drill.
Hammers 1566 lb, single frame steam. (2)
Hammer, 2006 lb, single frame steam.
Hammer, 2006 lb, single frame steam.
Hammer, 3-166 lba, Bradley.
Lathe, 28" x18' F. E. Reid.
Lathe, 28" x18' F. E. Reid.
Miller, Hendy Lincoln.
Miller, Hendy Lincoln.
Pipe machine, 13" B. & K.
Planer, 24218' fron.
Press, No. 5 Garrison double crank forging, 6" stroke,
18" die space 54918'' bolster plate, 37,000 lbs.
Presses, 2"-Frankfort double crank forging, 44" stroke
104" die space 54918'' bolster plate, 13,000 lbs. cach.
Presses, 2"-No. 5 Garrison double crank forging, 6" stroke
104" die space 54918'' bolster plate, 13,000 lbs. cach.
Presses, 2"-No. 5 Garrison double crank forging, 6" stroke
164" die space 54918'' bolster plate, 13,000 lbs. cach.
Presses, 2"-Lennox throatless
Shear, 4" Lennox throatless

The Nutmeg State Machinery Corp. 1041-1051 State St., New Haven, Conn.

1041-1051 State St., New Haven, Conn. Chucking machine, Potter & Johnston No. \$A. Drill press, H&W. 6 spdl., class B 12" overhang. Drill press, Leland Giff., 4 spdl., b.b., p.f. to each spdl, Gear cutter, P & W 11" vert. surface with mag. chuck. Grinder, De W 12" vert. surface with mag. chuck. Grinder, Bryant No. 16, m.d. int. chuck. (like new (2) Miller, Hrown & Sharpe No. 18, production. Miller, Kempsmith No. 32, Lincoln type. Miller, Leea-Bradner No. 38 with 9 collets. Profiler, Leland Gifford, grd., agl. spindle. Tappers, Anderson No. 46, m.d., dialfeed. Turret lathe, Brown & S. No. 4, chuck p.f. to turret, Wire formers, Nilson No. 3 and No. 4, 4 slide.

FOR SALE BY

Tri-Machine & Tool Co. 248 LaFayette St., New York City

Boring mill, horizontal, Newark, 3" bar, Grinder, No. 3 Landis univ. cyl., 13" x42". Grinder, No. 18 Bryant internal. Miller, vertical, Becker No. 2. Planer, 38" x88" x13" Woodward & Powell. Planer grinder, openside, 48"x13". Radial drill, 3" Gang & Co. Screw machine, Cleveland auto., 1" capacity.

Wisconsin Gear & Engineering, Inc. 602 So. Second St., Milwaukee, Wis.

Bilgram bevel gear generator, 16". Guaranteed to be in A-1 condition, with all change gears & segments

D. H. Prutton Machinery & Tool Co. 5295 West 130th St., Cleveland, Ohio

Broach, No. 2 Lapointe, 2 spindle.
Drill press, 4 spindle b.b., power feed, m.d.,
4 Slide machine, No. 3 Manville.
Grinder, disc, No. 50 Gardner, m.d.,
Grinder, disc, 22 Gardner, m.d.,
Grinder, disc, 23 Gardner, m.d.,
Grinder, disc, 23 Gardner, m.d.,
Grinder, disc, 23 Gardner, m.d.
Fresses, 25 to 85 too.
Tapper, 24 "Garvin.
Tapper, 24 "Garvin.
Unishear, 30", 14 gauge, m.d.

Campbell's Creek Railroad Co. Reed, W. Va.

Bevel Shear, Ryerson, with 1\(\frac{1}{2}\text{x12}''\) shear blades, m.d. Traveling Crane, 20 ton single drum, P & H. electric, with load brakes, srl. No. 7563, spread 8' 6", 230 v.,a.c.

Superior Manufacturing Co. Albert City, Iowa.

Will trade 5/16" rd. by 12' SAE - 1112 cold rolled steel for 17000 lbs., or fraction thereof, 4" square x - 1112, 1112, or leaded steel. Are willing to make outright purchase if trading not desired.

Long Machinery Co. 852 Summer Street, Boston, Mass.

Grinder, Pratt & Whitney, 14" b.b., vertical, motor dr. 20 h.p. motor, a.c., with magnetic chuck & generat. Planer, Whitcomb, 12" crank, m.d.

Factory & Mill Supply Co., Inc. 176 Federal St., Boston, Mass.

Grinders, internal or cylinder, No. 85 Heald. Lathe, engine, 54"x24". Planer, 24"x24"x8' Whitcomb, one head.

Auburn Metal Products

Box 367, Auburn, Indiana
Press—No, 56‡ Consolidated, straightside, dbl. geared
125 tom cap., 24‡" between uprights, bolster plate
24x86", stroke 6", weight about 28,060 lbs.

USED AND REBUILT MACHINERY

FOR SALE BY

Lang Machinery Company

28th St. & A. V. R. R.

Pittsburgh, Pa.

Lang Machinery Company

28th
Air compressor, N-826 Chicago, 427 d.f., cil. m., m. d.
Air compressor, N-826 Chicago, 427 d.f., cil dr.
Angie planer, No. 3 Thomas, m. d.
Bending rolls, solid end6" x3/16", b. d.
Blower, 6 B Wilbraham-Green, II, 230 c. f. m., m. d.
Bol couter, staybolt If "A cme, leadscrew, m. d.
Bol touters, atome sgl. 2 dbl. head, If"—2".
Brach, No. 2 La Pointe, stroke 44", m. d.
Bolt cutters, A cme sgl. 2 dbl. head, If"—2".
Brach, No. 2 La Pointe, stroke 44", m. d.
Bulldozers, No. 2 & No. 4 Wms. 2 White, m.d.
Centering machine, P&W. 4" 2 spdl., b.d.
Centering machine, P&W. 4" 2 spdl., b.d.
Centering machine, P&W. 4" 2 spdl., b.d.
Dieflier, Kearwin, tbl. 18" x17", str. 9".
Drill, mult. 3-spindle Rocktord, s. p. d.
Drill, radial 4" plundle 2-13 Fox, b. d.
Gear cutter, spur 36" x18", B. & E., m. d.
Gear cutter, spur 36" x18", B. & E., m. d.
Gear cutter, spur 36" x18", B. & E., m. d.
Gear planer, 38" Gleason, bevel, m. d.
Generator, 180 KW Jeffrey, d. c. 230 v. b. d.
Generator, 180 KW Jeffrey, d. c. 230 v. b. d.
Generator, 180 KW Jeffrey, d. c. 230 v. b. d.
Gender, cutive, No. 3 Backer, 34", m. d.
Grinder, dbl. end, Standard Elec. 7# H. P. 220 v. d. c.
Grinder, v. v. Wells 6" 14" m. d.
Grinder, v. v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well, standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well 8" x19" well well yellow the standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. well 8" x19" well yellow the standard Rice. 7# H. P. 220 v. d. c.
Grinder, v. wellow the standard Rice. 7#

it. & A. V. R. R.

Press, hydr. 200 ton Watson-Stillman upr., stroke 25".

Press, hydr. Woods 1800 ton, platen 42". 25", 4 post.

Press, horning No. 21 Michigan, stroke 18".

Press, o.b.i. No. 3 Toledo, stroke 18".

Press, proving No. 21 Michigan, stroke 18".

Press, proving No. 21 Michigan, stroke 18".

Press, proving No. 31 Michigan, stroke 18".

Press, straight side No. 59 Bliss, stroke 5".

Press, straight side No. 59 Bliss, stroke 5".

Press, straight side No. 59 Bliss, stroke 5".

Press, hydraulic shell bending. No. 4, 12-cyl.

Press, hydraulic shell bending. No. 4, 12-cyl.

Pump, centriugal Yould 2 H. P., m. d. 19".

Pump, Worthington 12" x12" 22 gpm. 3000 lb. steam.

Pump, Worthington 12" x12" 22 gpm. 3000 lb. steam.

Pump, while year of the strong of the strong of the strong of the proving the proving the strong of the strong of the proving the proving the strong of the strong

Capitol Machinery Exchange 1342 Atlantic Ave., Brooklyn, N. Y.

Lathes, 18"x1", 18"x10', Lodge & Shipley, Lathe, 16"x28"x11'x16', Faye & Scott, gap. Lathe, 16"x10', Monarch, m.d. Miller, 39 Fox. Miller, 50 Fox. Shaper planer, 24"x60", Cincinnati, Shapers, 24", 20", Smith & Mills.

Keystone Engineering Co. 1442 - 48 So. San Pedro Street

Los Angeles, California.

Subject to prior sale.

Subject to prior sale.

Subject to prior sale.

No. 1883. This machine is in excellent condition, complete with forms and 5 horsepower motor drive and controls. Will cut 45" mitre gears or 60" bevel gears up to 4" circular pitch.

USED AND REBUILT MACHINERY

FOR SALE BY

Joseph Hyman & Sons, Tioga and Almond Sts., Philadelphia, Pa.

Russell Machine Co. Pittsburgh, Pa. 438 Oliver Bldg.

438 Oliver Bldg. Pittsburgh, Pa.
Broach, No. 2 LaPointe, m. d.
No. 24 Foote-Burt 24" heavy duty, s. p. d.
Gear planer, 34" Gleason, b. d.
Gear planer, 34" Gleason, b. d.
Grinder, Yanke drill, cap, up to 34"
Lathe, Turret 34" x24" J. d., grachebar work.
Press, d. d.
Tress, d. d. 3 Blins, end wheel, roll feed.
Presses, o. b. i. No. 2 Toledo and No. 18 Bliss.
Presses, o. b. i. No. 2 Toledo and No. 18 Bliss.
Punch, No. 2 Bliss, end. 60" th. 14" -1" arch jaw.
Punch, No. 2 Bliss, end. 60" th. 14" -1" arch jaw.
Punch, No. 2 Bliss & Jones, horix, b. d.
Saw, Laidlaw metal cutting band saw, m. d.
Shaper, draw cut, 48" Morton, m. d.
Shaper, 32" Smith & Mills Planer type, b. d.
Slotter 18" Dill, table 34" diam., m.d.
Upsetting machines, 22, 33, 4 and 5" Ajaxiron bed.

North Machine Tool Corporation 179 Lafavette St., New York, N. Y. WOrth 4-5690

WOrth 4-5690
Automatics, Clev. model B, 7/8* single spindle, (3).
Automatic Clev. model A, 2*, single spindle, (2).
Automatic die cutting mach. Keller w. 2 motors.
Gear cutter, 18* Brown & Sharpe.
Gear cutter, 18* Gleason, straight bevel generator.
Grinder No. 1 Cincinnat univ. tool.
Grinder, tool, Gisholt univ.
Lathe, 14* 38 Monarch, q.c.g.
Lathe, 2**12* Monarch, q.c.g.
Lathe, 2**12* Monarch, q.c.g.
Millers, Hendey Lincoln type, (2)
Shaper, 30* Ohio.
Turret lathe, 24* Gisholt, 28* hole through spindle.
Turret lathe, 28* Gisholt, 28* hole through spindle.
Partial Esting only. Please send us your inquiries.

FOR SALE BY

D. E. Dony Machinery Co. 47 Laurelton Rd., - Rochester, N. Y.

Gear shaper, No. 6 Fellows. Press, 300-ton Dunning & Boschert, hydraulic tire, with self contained pump. Shaving machine, No. 2 Pratt & Whitney.

Failor-Strafer Machinery Co. 880 Bergen Ave., Jersey City, New Jersey

Blue print drying machine, 42" Paragon.
Drill, No. 6 Baush, adj. mult. spindle, 32" rd. hd.,
Flanging machine. No. 4 McCabe.
Grinder, No. 58 Heald, Internal, belt drive.
Keyseater, No. 3 Mitts & Merrill, b.d.
Pipe threading machines, (Saunders & Cox) with die
heads and dies 4" to 12" incl.
Press, No. 1 Bliss toggle.

Standard Machinery Co.,

347 Indiana Ave. Grand Rapids, Mich. Jerill, 40° New Haven No. 5, sliding bead, Drill, 2 spdl. Lelland Gifford, p. f., & t. a. Grinder, cylinder, Heald No. 85. Hammers, rivet, Grant No. 2 and No. 3. Keysaeter, No. 9 Mitts & Merrill. Lag screw pointer, Pawtucket. Lathes, mig., 11° 36° Prattà Whitney, (2), Punch & Shear, No. 6 Lennox. Roll former, Kane & Koach, 2 sets spindles. Tapper, Anderson No. 49 Dial Feed Auto. Welder, Expert Fortable spot, 50 KAUO.

Alex Zeeve & Company 2269 Woolworth Bldg., New York, N. Y.

Boring bars, portable, - 8"x18', 8"x12' and 24"x7'3" Underwood.

Boit threaders, 2" Acme "Class A", 14" National.
Drill, radial, 3" Mueller, gear box, a.p.d., box table.
Gear cutter, apur, No. 2A Newark, s.p.d., cap, 24"x8"
Grinder, cyl., 12"x86" Landis plain.
Hammers, forg., No. 1-B, 2-B & 4-B, Nazel, pneum.
Hammers, pr., 580 (2) & 460 lb. Beaudry "Champion",
Irowworker, comb.—Size 91—16 Smith armorplate,
with notcher, a. c. — m. d., No. 18 Pels, b.d.
Keyseaters, No. 3 Mitts-Merrill, No. 2, & 1, Baker,
Lathes, engine—38"x26" Rahp.—Mayer-Carpenter semiq.c.; 24"x16" Whitcomb-Blaisdell, q.c., s., taper.
Plauer, crank, 28"x26"x24" stroke Cincinnati, 1 rail
head, belt drive. Underwood.

Lathes, engine—39 kay hamin negl, c.g., taper.

Janer, crank, 28"x28"x28" stroke Cincinnati, I rail head, belt drive.

Punch & shears, dbl. end, style "W" Cleveland, cap.
29" thru 19", with self-cont. jib crane.

No. 3A Royersford, cap. 1" thru \$" shears 8" x \$" flats or 18" rounds, a.c., m.d., No. 48 Cleveland, D. E., armor-plate frame, 38" throats, a.c., m.d. Punch presses, o.b. i. No. 4 Rockroft geared. 3" stroke (48 tons). No. C-4 Ferracute plain, 18" stroke (48 tons). No. R. C-4 Ferracute plain, 18" stroke (48 tons)

THE ONLY DRESSER MOUNTED IN DIAMITE, THE TUNGSTEN-CARBIDE ALLOY, SURPASSED IN HARDNESS ONLY BY THE DIAMONDS THEM-SELVES.

Together, this combination of a cluster of diamonds and DIAMITE mounting makes for the most efficient, most dependable, most economical wheel dresser that your money can buy.

Diamonds are inseparable a There are no lost diamonds, no resetting, no time, money or production lost a Many sharp cutting points in super-hard DIAMITE mean longer life for the dresser, maximum utilization of diamonds and constant contact of cutting points with the wheel, until the tool is completely used up a Accurate, precision dressing is assured for all makes of grinders.

Send for folder on complete line of DIAMITE mounted tools for every industrial purpose.

DIAMONDS FOR INDUSTRY

TRY A "BULLET' FROM INDUSTRIAL AT OUR EXPENSE. Select correct size from above table, send in your order for a "Bullet" today. Put it to the severest test. If it does not come through with flying colors, return it within 30 days and we will return your money. Use this coupon.

TRIAL

INDUSTRIAL DIAMOND CO. DETROIT, MICH.



INDUSTRIAL DIAMOND CO., SEVEN AVALON AVENUE, DETROIT, MICHIGAN

Gentlemen: I like your offer as outlined above. Please send me one trial "Bullet" size as indicated.

SIZE ORDER NO.

NAME

ADDRESS

CUTTING-OFF

Now Made Much Easier for All Lathe Operators!

LOMBARD POWER-FEED TOOL HOLDER Eliminates Cut-off Problems

Cutting-off in a lathe has always been a most difficult job, because the stock jumps, lifts and climbs on the tool—breaks tool, or ruins work. All this is now made impossible with the Lombard Power-Feed, Steady-Rest Cut-Off Tool-Holder, because the blade is always held in the same steady position in relation to center of work—no chance for work to lift. Chips cannot build up, or stick to side of cut, because they are cleared out on each revolution of the work, due to the tool operating smoothly without vibration.

Makes Cut-off Blades Last Much Longer

-because they don't break, due to steady-rest support.



It's the New Way to Cut-off!

Different from Any Other Cut-off Tool Holder

—because it has a steady-rest that rides over the work when cutting off in a lathe. It holds the cut-off blade steady, preventing chatter. Instead of breaking chip, it peels off a continuous ribbon. Operates perfectly on Power-Cross-Feed.

Operates Smooth and Steady Stock can't lift. Different—has a shearing action. Makes any lathe cut-off evon smoother than most screw-machines. Makes tool cut like cheese.

GUARANTEED

to be the smoothest cutoff tool everused, or money will be refunded.

PRICES

For 12' to 14' Lathe \$14.75 For 16' to 18' Lathe \$15.75 Add \$2.00 for Extra Heavy Duty Model

Order Direct! Money-back Guarantee!

LOMBARD MANUFACTURING CO.
16217 Linwood Ave. Detroit, Mich.

USED AND REBUILT MACHINERY

FOR SALE BY

West Penn Machinery Company

West Penn Machinery Company
Air compressors, 30 to 2500 cubic feet,
Baling press, paper, Logemans, b.d.
Bending rolls, 8'xy" H&J, drop end,
Blower, No. 4 Roots, capacity 21:0c. f. m.
Blot cutters, 19'x" -3"-4" Acme, b.d.
Blue print machine, 60" a. c., 110 volt.
Buldozers, Nos. 2.4, 6, 9, 28, 239.
Crusher, Jaw, No. 4 Champion, b. d.
Die filer, No. 3 Thiel, m. d.
Drill, radial, 4" Bickford, m. d.
Drill, radial, 4" Bickford, m. d.
Drill, radial, 4" Bickford, m. d.
Drill, No. 34 Foote Burt. 2", b. d.
Engling, ga., 20 horse power Bessemer,
Gent tester, beving the control of the control of

1210 House Building. Pittsburgh, Pa.

Miller, shaper, duplex, No. 14 Cochrane-Bly, m.d.
Miller, vertical, Burke, table, 18x6, b. d.
Miller, spline, P&W, double, 2".
Nibbler, No. 1 Campbell 3'16" 6" gap, m. d.
Pipemche, 2".4", 6", 8"12"&16" Landis-Oster-Williams.
Press, double acting 69 · N Bliss, geared.
Presses, horning, Nos. 38 & 39 Bliss, b. d.
Press, No. 19 Bliss o.b.i., b.d.
Press, No. 19 Bliss o.b.i., b.d.
Presses, No. 19 Bliss o.b.i., b.d.
Presses, No. 19 Bliss o.b.i., b.d.
Presses, Stiles, type, 14 and 34" m. d. Press, Arch. No. 30 Bliss, bd.
Press, No. 18 Bliss obd., bd.
Press, No. 18 Bliss obd., bd.
Press, Roy. 18 Bliss obd., bd.
Press, Roy. 18 Bliss obd., bd.
Press, Roy. 15 ton Howard.
Press, Roy. 15 ton Howard.
Punch. No. 6 L&A. 47 db. d.
Punch. No. 6 L&A. 47 db. d.
Punch. No. 6 L&A. 47 db. d.
Punch. No. 14 W&W. Arch isw, 1*-1".
Punch, horis, 1"-1" Cleveland, m.d.
Riveters, air, hammer, spinning.
Saw. cold 60" Newton, m. d.
Saw. metal band, 10"-10" Napier.
Saw, friction No. 1 Ryerson 220/3/60.
Shapers, 16". 20", 24" & 28" Gould & Eberhardt.
Shear, throatless 8" Lennox, m.d.
Shear, strong 18" Newbold, 50" gap.
Shear, splitting, 1" Morgan, bd.
Shear, Rotary 8" Newbold, 50" gap.
Shear, Splitting, 1" Morgan, bd.
Straighten, 1" Fritmam, bd.
Straightener, 10" 11 roll, 50" dia.
Straightener, 12" A&I. 5 rolle, 64" dia.
Straightener, 15" Ston hyd, 10" bed.
Testing machine, 400,000 lb. Riehle, b. d.
Upsetters, 1" to 6".
Woodworker, universal Parker, m. d.

C. R. Daniels 1608 W. Capitol Drive, Milwaukee, Wis.

Arbor press, No. 5 Greenerd, 12 ton cap., rebuilt. Bending rolls, 10° Hilles & Jones, motor driven. Drill press, No. 2 Baush 22 spd., 18° x30° head, 15 h.p. Milling machine, No. 6 Burke, bench, hand feed. Riveter, 80 ton Wood 10° hydraulic vertical.

Jones Machine Tool Company Front & Pike Sts., Cincinnati, Ohio

18x10 G&K gd. hd. ,m.d. 24x12Am. q.c., 3 s. c. 24x14' L&S, grd. bd. 27x33' L&S, grd. hd. 22x12' LeBlond,g.h.,m.d.

10' Streine 10 ga. press br. 10'—10 ga. Ohl press brk. 25" throat Wickes punch. No. 15 Tol. deep throat No. 92D Tol. dbl. crank. No. 98 B. & B. 48" D. C. MISCELL

No.4 Brown Sharpe univ. miller s.p. motor drive. "Bullard ver. bor. mill. 48" B. & S. gear cutters.
2-Trundle thrd. millers.
28" Niles Bement crank shaper, 28" Gould Eberht, crank

shaper, m.d. 3' Am. rad. s.p., m.d. Ingersoll (tub) grinder.

LATHES 20x15' Am., q.c., cone dr. 20x22' L&S, 2C, cone. 24x10 Harring, lc., cone. 24x16 Bradford, lc., cone. 30x12 Niles, lc., cone.

PRESSES SSES No. 264 Bliss 48" dbl. cr. No. 160 Cons. dbl. crank. No. 44 Niagara dp. thr. Robinson s. s. press, 16" No. 20 Excelsior m. d. No. 17 Rob. horn press. NEOUS

24" Streit pulley lathe. No. 2 Savage nibbler 36" throat, #" cap. 40 k. w. spot weld. 36" th. 180 t. vertical hyd. pr. 2" Reliance bolt cutter. by Schuster wire straigt No. 55 Heald grinder. Klem metal band saw. 24"x24"x7' Powel planer. 6x20" Fitchburg cyl. gr. 96" ft. power sq. shear.

S. M. Regar Machinery and Mill Supplies

Air compressors, portable and stationary. Bolt and pipe threading machines 4-12" cap. Boring mill, Amer. horis. 3 spindle, Broaching machine 3-B LaPointe. Cutting-off machines and cold saws. Cutting-off machines and cold saws.
Lathes, automatic, rapid production 18"x8' pan bed (2).
Lathes, Morton keyseater.
Planer, Putnam, 24"x2"x8'.
Planer, Sellers, 38"x38"x19".
Planer, Sellers, 38"x38"x19".
Radial drills, Baush 7". Harrington 4', American 3'.
Slotter, 15" Bement Miles, 38" pow. cir. table.
Shaper, 38" Putnam friction feed.

Reliance Machinery Sales Company 1407 Brighton Place, N.S. Pittsburgh, Pa.

Air compressors, 348 and 450 cu. ft.
Bending roll, angle, Buffalo, cap. 4x4x9" angle.
Benke, press, 6'x16 ga. Robinson, toggle.
Bulldoser, No. 4 Williams-White.
Drill, radial, 3' Fosdick cone.
Grinder, No. 16 Bealey double disc, 26° discs.
Hammer, 360 lb., Beaudry upright.
Pipe machine, 12' with Landis head.
Press, No. 32°. C Toledo dbl. crank, 44" wide, 5" shaft, 2" stroke, m. d.
Pump, Goulds centrifugal, 3 stage, 250 g.p.m. against
47' head, m. d.; 2-30-220 v.
Pump, hydraulic, 3 g.p.m., 1600 lb. pressure.
Punch L&A horizontal, 1" thru 1".
Punch 48" tht., single end 1" thru. 1" arch. jaw.
Punch 48" tht., single end. 18" thru 1", arch jaw.
Punch 48" tht, single end. 18" thru 1", arch jaw.
Panch 48" tht, single end. 18" thru 1", arch jaw.
Panch 48" tht, single end. 18" thru 1", arch jaw.
What do you need? What have you for sale? Air compressors, 348 and 450 cu. ft.

FOR SALE BY

B. D. Brooks Co., Inc.

361 Atlantic Ave.

Boston, Mass.

Sheet metal working machinery, hand and power. All types of new and reconditioned equipment. Apron brakes, press brakes, shears, folders, Bending rolls, corrugating rolls, forming rolls Punches, beaders, rotary machines, stakes, etc.

Kato Engineering Co. Mankato, Minn. WANTED

New or used V & O punch press either No. 01, 01S, 41N or similar. Also any make punch press or approximate above sizes with adjustable knee or

FOR SALE -GOOD TOOLS

Drill, 4 Spdl., Demco, Model DB.

%" cap. \$850. Lathe, 14"x5' Hendey, Q.C., Pan, Chuck, B. D.

Press, No. 126 Max Ams O.B.I. 1" str. \$225. Shaper, 14" Steptoe, SG., Vise & Motor Shaper, 16" Steptoe, B.G., Vise &

BANSBACH MACHINERY CORP. 3911 West Madison Street. Kedzie 0212

1—20"x9' Prentice Geared Head Lathe 1—12"x4'/s' Simplex Geared Head Lathe, Motor Drive 1—24"x10' Reed Standard Change Lathe,

Complete
1-24"x24"x6' Lodge & Davis Planer, Mo-

1-24 x24 xb to your control of the control of Drive to Drive to 27"x18" LeBlond Production Lothe, Timken Bearing, 2 Carriages 1-F & S Internal Grinder, Power Feed 1-&x8 Peerless Universal Shaping Saw 1-Keller Automatic Engraving Machine, 2 Routing Spindles

WIENER MACHINERY CO., INC. 237 Centre St., New York, N. Y.

HIGH SPEED CUTTING TOOLS

BOUGHT AND SOLD

MILLING CUTTERS, TWIST REAM. DRILLS, ENDMILLS, ERS. SLITTING SAWS.

AMERICAN TOOL SALVAGE CORPORATION

100 S. Jefferson St.,

2330

Chicago, III.

BAR STOCK WANTED

We will purchase any available surplus stocks of round bars, hot rolled or cold drawn, in the following grades of steel:

> SAE Nos. 2340 3115 3120

3130

MODERN COLLET AND MACHINE COMPANY 401 Salliotte St., Ecorse, Mich.

SELLING FOR CUSTOMER

frame, motor drive complete....\$450. Slitter, Yoder, G 48", Gang, M.D. with Grinder

BANSBACH MACHINERY CORP.

3911 W. Madison St., Chicago, III.

Tel. KED. 0212



For those "hard to find" machines and tools you are welcome to use our "Buyer's Service" without obligation.

Just another BLUE BOOK service



Waterproofs Masonry

Development of a new, powerful, chemical powder, called Drye, and said effectively to waterproof brick, stone and stucco is announced by Weather-seal Products Co., Cincinnati, O.

Inside or outside, it is said to waterproof basements, walls before plaster is applied, leaks in mortar joints and This product can be used cisterns. for hardening and waterproofing cement and mortar when included in the mix, and is suitable for patching cement floors and bonding tile to cement.

The product is easily mixed with cold water to form a paste which can be readily brushed or troweled on the walls or surface to be waterproofed. Only one application is required for outside work; 2 coats if applied inside. Coverage is said to be approximately 10 sq. ft. per lb.

Cost is estimated at no more than 2c per square foot,

Flame Resistant Insulating Varnish

The sterling Varnish Co., 138 Ohio River Blvd., Haysville, Pa., has recently developed a new flame-resisting insulating varnish, designated as R-878, which is recommended for class B high temperature insulation.

This new varnish is mechanically strong and dries all the way thru when applied to electrical apparatus. After drying, R-878 will not support combustion, when the flame is removed. neither will it melt nor resoften under operating temperatures. In addition to good heat resisting qualities, it has all the characteristics of highgrade insulating varnishes.

This new flame-resistant insulating varnish is one of the many contributions of the Sterling Varnish Company to the all-out war effort. The manufacturer will be pleased to furnish additional information on request.

Buy War Saving Stamps - and lick them on

the other side

WANTED

TAPS-TWIST DRILLS-FILES CUTTERS-ENDMILLS-SAWS HACK SAW BLADES

WE WILL BUY YOUR SURPLUS TOOLS

SURPLUS TOOL EXCHANGE 619 W. Randolph St., Chicago, Illinois SURPLUS BOUGHT AND SOLD

AUTOMATIC, 5% Chicago single spindle.

RADIAL, 21/21 Carlton, High Speed

QUICKWORK, rotary shear, 10A 60° throat, 14 gauge.

E. L. KLAUBER MACHINERY 3221 Olive St., St. Louis, Mo.

NEW INDEPENDENT LATHE CHUCKS IMMEDIATE DELIVERY

				PRICE
18"-4	Igw	Independent	Chucks	\$ \$8.00
20"-4	Jaw	Independent		112.00
24"-4	Jaw	Independent	Chucks	146.00
8"-4	Jaw	Independent	Chucks	160.00
32"-4	Jaw	Independent	Chucks	225.00
36"-4	Jaw	Independent	Chucks	275.00

James W. George Machinery Co. 3146 E. Jefferson Ave., Detroit, Mich.

WANTED

Fitchburg Lo-Swing Lathe 8" Swing, 60" Centers preferred

Motor Sales & Service Company 461 Brunswick Ave., Trenton, N. J.



IN STOCK

AUTOMATICS

No. 515 National Acme, four spindle No. 52 National Acme, four spindle No. 53 National Acme, four spindle '4" Cleveland Model A, single spin-

BROACHES

No. XB10 Oilgear Hydraulic Twin Spindle 15 Ton Hercules Vertical

DRILLS

4' Prentice Radial

No. 1¹/₄ Foote Burt, 2 spindle No. 15¹/₂ Foote Burt Fixed Center No. 37 Natco Multiple Spindle No. 1 Bausch 8 spindle Pratt & Whitney Gun Barrel, 2 spindle, motor drive

GEAR CUTTERS

No. 5 Cincinnati Automatic Gear Cutter

No. 3 Brown & Sharpe Automatic No. 36 BM Gould & Eberhardt Rougher, three spindle

No. 6 Fellows Gear Shaper 96" Gleason Gear Planer

15" Gleason Spiral Bevel Generator

15" Gleason Spiral Bevel Generato 18" Gleason Gear Tester

18" Gleason Gear Tester
5A Lees-Bradner Gear Generator

No. 10 Lees-Bradner Gear Generator No. 10 Lees-Bradner Gear Grinder 30" Rochester Gear Tooth Rounder

GRINDERS

10x20 Landis Cylindrical Hydraulic 12x42 Landis Cylindrical No. 55 Heald Internal No. 60 Heald Internal No. 24-53" Gardner Disc

LATHES

17"x8' Sidney, c.d.
18"x6' Lodge & Shipley, c.d.
18/24"x12' South Bend Gap, c.d.
26"x14' Niles Bement Pond, c.d.
17"x8' Wickes Production, c.d.
3½x60" Fitchburg Lo-Swing—G.H.

TURRET LATHES

No. 3A Warner & Swasey, gh. No. 6A Potter & Johnston, gh. 3"x36" Jones & Lamson, gh. No. 9 Bardons & Oliver, c.d.

MILLS

No. 1½B S Milwaukee, s.p.d. double o.a. No. 1 Milwaukee Manufacturing.

s.p.d. No. 5C Becker, Vertical

Becker, Vertical

MISCELLANEOUS

No. 3E Lees-Bradner Thread Miller,
Collet Type
% "x18' Nilson Wire Straightener
Wicaco Oil Groover
2" Pratt & Whit. Duplex Spline Mill
No. 2 Davis Keyseater

PLANERS AND SHAPERS

32"x32"x10' New Haven Planer 18" Lodge & Davis Shaper 20" Rockford Shaper

TAPPERS

1/2" Rickert Shafer, Radial

Indianapolis Machinery & Supply Co., Inc. 1959-69 SOUTH MERIDIAN STREET. INDIANAPOLIS. INDIANA

-09 SOUTH MERIDIAN STREET, INDIANATOLIS, INDI

EASTERN BRANCH: 44 WHITEHALL STREET, NEW YORK, N. Y.

IMMEDIATE DELIVERY



Single Spindle Cone Automatic Piston Turner

16¹ x 32¹ LANDIS CRANK GRINDER Serial No. 13897— Belt Drive Self Contained Countershaft—Oil Pump and Tank.





HEALD No. 65 Internal Grinder
-Automatic Power Feed.

Grinds Holes 3"x 15" — Table 36"x18"; with 24" ADJ. Spindle 16" Long.

W. L. STEEGE MACHINERY CO. 100 So. Jefferson St., Chicago, III.

EMCO REBUILT

100 lb. Little Giant, m.d.

PLAIN CYLINDRICAL GRINDERS 10x18" No. 14 Brown & Sharpe. belt 10x24" Landis, m.d. 10x36" Norton, m.d. 10x36" Landis Integral Cam, m.d. 10x36" Landis Integral 10x50" Norton, m.d. 10x52" Landis, m.d. 10x72" Norton, m.d. 12x36" Cincinnati, belt 12x36" Modern, belt 12x36" Modern, m.d. 12x42" Landis, belt 12x48" Modern, m.d. 12x49 Modern, In.d. 16x120" Landis, m.d. 26x96" Landis, m.d. UNIVERSAL CYLINDRICAL GRINDERS No. 2 Bath Universal 12x42" Modern, belt 12x48" Cincinnati Self-Contained, m.d., late type VALVE SEAT GRINDER
Cincinnati Centerless Type Valve Seat Grinder, m.d. CYLINDER GRINDERS No. 50 Heald, hydraulic, m.d.
No. 55, 60, 65 Heald, mechanical feeds
DISC GRINDERS
No. 4 Gardner Ball Bearing, s.p.d.
No. 20 Gardner Combination Disc and Roll, m.d. No. 120 Gardner Plain Double Disc EMERY GRINDERS Leland & Faulconer No. 1 Wet Mitchell-Bennett Buffer
Strand M7 Flexible Shaft Grinder
Rockford Wet, belt
Springfield Wet, m.d. Diamond Emery, belt No. 8 Hanson & Van Winkle Polishing Hill-Curtis Polishing
Mitchell Engineering Type Al Polishing, m.d. H.P. 5 H.P. Northern, m.d. U. S. Electrical Tool Polishing, m.d. INTERNAL No. 10 Bryant, belt SURFACE Walker Single Stroke Surface, 10" magnetic chuck
No. 1 Fraser Lapper, belt
TOOL 6 CUTTER GRINDERS
Yankee Twist Drill, 11/4" cap., belt
Gisholt Universal Tool, belt Gleason Cutter, belt Gould & Eberhardt Gear Cutter, belt Modern Chaser, belt
Gorton Tool, m.d., late type
HAMMERS

800 lb. Bement Single Frame Steam 1000 lb. Bement-Miles Single Frame Steam 1100 lb. Niles-Bement-Fond Single Frame Steam 2000 lb. Niles-Bement-Pond Single Frame Steam 2500 lb. Bement-Miles Single Frame Steam Pettengell Bumping, belt
KEYSEATERS No. 0 Mitts & Merrill No. 1 Baker No. 2 Morton Morton Keyway Cutter & Slotter, 24" stroke No. 4 Mitts & Merrill
ENGINE LATHES 16"x8" Champion 18"x8" American, taper, relieving attach. 18" raised to 28"x10" Reed 18" rdised to 28"x10" Reed
18"x12" Barker
18"x18" Reed
20"x8" Fay Scott
21"x12" Bradford
22"x13" Niles
22"x18" centers (22" bed) American 100
H.P. Input Super Lathe, with d.c. electrical equipment, geared head, very
late type, weight 65,000 lbs.
22"x18" Niles
24"x8" Riesd
24"x11" Chard
24"x11" Chard
24"x12" Reed
24"x18" Schumacher-Boye
26"x16" Setu-Bridgeford, taper 26"x16" Betts-Bridgeford, taper 27"x16" Lodge & Shipley 20"x14' Hamilton 28"x14' Lodge & Shipley McCabe 2 in 1—24-48"x16' MANUFACTURING LATERS
31/2×36" Lo Swing
3×80" Lo Swing 3½x36" Lo Swing
3x80" Lo Swing
11"x4" Wells Speed
12"x5' Sebastian Geared Head Turning
14"x6' Champion Mfg.
15"x6' Automatic Threading
16"x6' Fulton
16"x6' Rockford
20"x8' American Turret
30" Streit Fulley Lathe
Niles-Bement-Pond Axle Lathe
12-296" No. 5 Niles-Rement-Pond Can 296" No. 5 Niles-Bement-Pond Center Driving Car Wheel Lathe, new Niles-Bement-Pond Quartering Machine, m.d., new MILLING MACHINES
No. 2 Rockford Plain, cone No. 1 Cincinnati Plain, cone No. 2 Knight, s.p.d. No. 3A Heavy Brown & Sharpe Universal,

PARTIAL LISTING ONLY.

THE EASTERN

m.d.

1001 TENNESSEE AVENUE.

60 lb. Bradley Rubber Cushioned Helve,

100 lb. Little Giant, belt

MACHINE TOOLS

No. 5 Becker Vertical No. 5 Becker Vertical
19" Cincinnati Mfg., m.d.
4½x12" Pratt & Whitney Thread
6x14" Pratt & Whitney Thread
Pratt & Whitney Lincoln Type
36"x36"x14" Bement Slab, m.d., p.r.t.
40" Ohio Tilted Rotary, m.d.,
10" Lord Physics State S 'A' Landis 2 spindle Pipe & Nipple, belt Bignall & Keeler, belt Bignall & Keeler, m.d. 2" Jarecki, m.d.
2" Jarecki, m.d.
4" Eaton, Cole & Burnham, cone
4" Bignall & Keeler, belt
4" Merrell, belt
15" Cox, belt

24"x24"x6' Gray, 1 head 24"x26"x8' Niles, 1 head 96"x36"x10' Ohio, 1 head PRESSES PLANERS

team Tme

me

team

2

0.0

ich.

100

elec-

AGLA

spier

ne,

dpar.

943

4

Waterbury-Farrel S.A. O.B.

No. 2 American Can Inc.

Perracute Stiles Type
D2 Ferracute St.B. Type
D2 Ferracute St.B. Type
D3 Ferracute St.B. Drawing
No. 6 Waterbury-Farrel D.C.

S0 ton Lourie Hydraulic type BX
S51 Ferracute D.C.

Metalwood Hydro-Pneumatic B33
No. 2684/2B Toledo D.C. Toggle Drawing,
weight 175,000 lbs.
No. 496D Toledo D.C. Toggle Drawing,
PUNCHES 6 SHEARS

Lleveland Model EF S.E.
No. 6 Long 6 Allstatter S.E.
Pexto Lever Punch
No. 2 Robinson, 144" stroke
Robinson Lever Punch
No. 2 Robinson, 144" stroke
Robinson Punch 6 Shear, 12" throat
No. 41 Lennox, belt Waterbury-Farrel S.A. O.B.

No. 41 Lennox, belt Ng. 2 Niagara Bench Type RIVETERS

4" Shuster " John Adt 6" John Adt
Hanna Bench Type Air
Pedrick & Ayer Pneumatic
Chicago Pneumatic, 24" throat
We. 3A, 5A High Speed Hammers

JAWS

Gemm Tilting Band Saw, metal

10. 2B, 4, 5, 6 Cochrane-Bly Cold Saws

10. 3, 8 Nutter & Barnes

10. 15 Lea Simplex

10. 16 Higley

"Avey Milband Cutting-off Machine, md.
"Newton Cold Saw

26 William Cold Saw

TORRET LATHES AND SCREW MACHINES

10. 0 Brown & Sharpe Hand

14.144" Jones & Lamson Geared Head. bar

3x36" Jones & Lamson Geared Head,

chucking (5) chucking (2) 338" Jones & Lamson Geared Head, bar 2 spindle 3x36" Jones & Lamson, chucking 24" Gisholt, m.d., cross sliding turret 24" Gisholt m.d., 4 way tool post and turret

Woods Tilted Turret

12" Smith & Mills 12" Smith & Mills
24" Milwaukee
24" American
24" Gould & Eberhardt
32" Smith & Mills

32" Smith 6 Mills
32" Morton Railroad Type Draw Cut, m.d.
AUTOMATICS
%-1/4" Cleveland Model B, m.d.
%" Cleveland Model A
4 spindle %" Cleveland Model M
11/4-1/4" Cleveland Model B
11/4-1/4" Cleveland Model C
No. 6D Potter & Johnston Automatic for brake drum work brake drum work

No. 33 New Britain Automatic, m.d BORING MILLS—VERTICAL 24" Bullard, 1 turret head 30" Colburn, 1 turret head

42" Niles-Bement-Pond Car Wheel Borer, facing attach. 48" Niles-Bement-Pond Car Wheel Borer,

facing HORIZONTAL BORING MILLS

4" bar Barrett 5" bar Newark 8" bar Barrett

BOLT THREADING MACHINES
9/16" Landis 2 spindle, m.d.
3/" Economy Style R Auto. Threading
1" 2 spindle Acme
1" 3 spindle Acme
1" 3 spindle Acme
1" Landis
No. 11-S Rickert & Shafer Auto. Threading, m.d.

No. 11ing, m.d.
2" Landis, belt
2½" Acme, belt
1½" American Bolt Heading Machine
BROACHING MACHINES
Cincinnati Rotary Mill Broach, m.d., new
No. 1, 2 J. N. LaPointe, belt
No. 2 J. N. LaPointe, m.d.
No. 3 J. N. LaPointe Double, belt
RADIAL DRILLS
A.c. m.d.

3' American Sensitive 3' Carlton Sensitive 4' Hammond Jack Knife
4' Hammond Wall Type
BALL BEARING DRILLS

Automatic Sensitive, 1/4" Foote-Burt Bench Type cap., m.d.

SEND US YOUR INQUIRIES.

AACHINERY CO CINCINNATI, OHIO

AUTOMATICS

14" Cleveland Model B No. 34 New Britain Chucking

BORING MACHS.

4-4" bar Niles, Knee Type M.D. 42"x24" Bullard New Eras

DRILLS.

Radial 6 spin. Bausch No. 2 M.T. 6 spin, Henry & Wright Sensi. 5' Pond M.D. (3) 4 spin. Allen, Sensitive 1 spindle Sensitive No. 11 Natco, 8 spin.

No. 13 P. & W. Multi

Baker Type M, Tapping

GRINDERS

No. o. 2 Churchill Internal, grind 30" deep, dist. of c can nd 30" deep, dist. of center spindle to top of table 18", M.D. No. 3 Cincinnati Centerless 10"x24" Norton Pl. M.D. 20"x96" Landis Cyl. M. D. 24"x 96" Landis Cyl. M. D. 30" x 240" Landis Roll M. D. 24" Blount Snagging

LATHES

4"x60" "Lo Swing" 28"x16' Pond, L. C. G. 30"x15' Putnam Axle M.D. Center Drive 36"x24' New Haven, Tri. Grd. 36"/60"x15' Harrington, Sliding Bed Gap 42"x14' L. & S. Tri. Grd. 42"/22' Putnam, blocks to 52" 48"x34' Bridgeford, Grd. Hd. 42"x30' Putnam, blocks to 48" 60"x32' New Haven, Tri. Grd. 90" N.B.P. Heavy, Wheel

MILLERS

8" Lees Bradner Thread Hall Planetary Thread Millers. Style D No. 6 Jackson Ve Die Sinker, M.D. Vert. Miller or No. 3 P. & W. Die Sinker No. 2 P. & W. Vert. Shaver

PLANERS & SHAPERS

26"x26"x8' Gray 24"x24"x8' Chandler, 1 hd. 24"x24"x6' Powell 48"x36"x12' New Haven, 1 hd. 60"x48"x14' Bertram, Openside, 3 hds., rev. M.D. 72"x72"x18' Cinci. 2 hds. 72"x60"x14' Cinci., 3 hds.

PUNCH & SHEARS

60" Cleveland EF Punch 48" Quick Work No. 5, 4" cap. 42" L. & A. S.E. Punch Capty. 1 1 2" x1", M.D. 30" throat Bement Miles Shear, M.D., Heavy for splitting . 4 H. & J. Dble. End P. S. 20" throats No. 11 Schatz Triple Comb. Cast Steel Frame Small Schatz Tri. Combn. Cast Steel Frame Armor, 6" angles, etc. Combn. angles, etc.

SLOTTERS 17" Sellers, M.D. 16" Sellers 10" Betts, Cone or M.D. MISCELLANEOUS

Bolt Cutter, 11" National Bolt Bolt Threader, 1"—11" Landis M.D. double hd.

Core Box Machine, Crane Dividing Head, 14" B. & S. Dividing Head, 12" K. & T. Furnace, Brass, 500 lb. Furnace, Westinghouse Elec. Gear Gen., 11" Gleason Bevel Gear Cutter, 36's Newark, Spur Gear Cutter, 36" G. & E. Spur & Berel Gear Cutter, 48" & 36" Cinci. Spur Gear Cutter, 60" Gould & Eber-Gear Cutter, 84"x16" G. & E. Gear Generator, 6" Gleason Bevel 4 Header, 14" Acme Rivet Jarring Mach., Herman Jolt Mould Keystr., No. 6 Catlin, 40" stroke up to 5" wide Keystr., No. 1 Davis, 1" capty. Keystr., No. 3 Baker, 26" stroke x 3" Keyways Keystr., No. 4 M & M. M.D. Magnetic Chuck, 24"x18" Walker on right angle plate Pipe Mach., 6" Saunders, M.D. Pipe Mach, 10" Bignall Keeler Pipe Mach., 12" Curtis & C. Pipe Machs. 3" Stover M.D. Press. No. 61 Spec. V. & O. Press. No. 58 Perkins S. S. Grd.. Rotary Table, 14" Kempsmith Rotary Table, 28" diameter Rotary Tables, 26" and 36" Saw, 10" Espen Lucas Cold Saw, 10" Nutter Barnes Cold Saw, 18" Higley, Cold Saw, No. 2B Cochrane Bly 6" Saw, No. 15 Lea Simplex Thread Miller, No. 3 Lees Brad-ner for 8" shells Threading Mach., 1" Geometric

Vertical Attacha., K. & T. &

Wire Straightener, 1" Shuster,

Kempsmith

Compressor, 179 cu. ft. M.D.

BENNETT & RAFKIN CO.

Offices: 30 CHURCH ST., NEW YORK CITY

CHOICE MACHINERY — NOW!!

CHUCKERS & SCREW MACHINES

2—No. 23 New Britain Chuck. Mchs. 1—No. 23 Prentice Chucking Machine

.

m. pur nci.

berevel (

uld #

oke V.

oke

ker

D. eler

rd..

rad-

tric à ster.

1942

DRILLS & TAPPERS

-Niles 6 Spindle Rail Drill -Niles 6 Spindle Rail Drill
4"x48" Cadillac Centering
-2½' Fosdick Radial
-No. 12 Natco Multiple
-2 Way L. & G. Drill & Tapper
-3 Way L. & G. Drill & Tapper
-3 Way L. & G. Multiple Drill
-Rockford 5-Spindle Drill
-Rockford 5-Spindle Drill -Rockford 5-Spindle Drill
-Simplex Greeniee Multi Horizontal Drill
-Single Spindle L. 6 G. Drill
-2 Spindle L. 6 G. Mult. Drill
-4 Spindle L. 6 G. Horiz. Drill
-4 Spindle L. 6 G. Horiz. Drill
-4 Spindle Prod. Drills—No. 3 M.T.
-6 Spindle Prod. Drills—No. 1 M.T.
-20" Single Spindle Cinc. Drill Press
-Single Spindle Prentice Drill Press
-16" Fox Sensitive Drill -18" Fox Sensitive Drill
-No. 2BG Garvin Tapper
-5 Spindle Detroit—Horizontal Drill American Sliding Upright Drill

GEAR MACHINES

1—Schuchardt & Schutte 51" Gear Hobber 1—3 Spdl. Gleazon Bevel Gear Rougher 2—18" Gleason Bevel Gear Generators 1—36" Fellows Gear Shaper 1—18" Gleason Bevel Gear Tester

GRINDERS & LAPPERS

-No. 1 Springfield Gage Grinder -Cincinnati Brake Drum -Cincinnal State Drum -No. 3 Brown & Sharpe Tool -No. 14 Gardner Opposed Disc -8 Spindle Foote Burt Valve Grinder -No. 6 Besly Double Disc Grinder—20" dia. discs

Type P4 Oliver Pedestal Die Filer

No. 65 Heald Grinder

No. 70 Heald Internal Grinder

10"x35" Norton Plain M.D.

No. 1-F Norton Vertical Lapper

No. 3 Thiel Die Filer

HAMMERS

—1100 lb. Erie Single Frame —900 lb. Bement Double Frame —600 lb. Erie Single Frame Forging —125 lb. No. 5 Power Hammer

LATHES

-17"x5' LeBlond Production -17"x6' LeBlond Engine Lathe -17"x8' LeBlond Engine Lathe
-26"x12' Prentice Engine Lathe
-27"x18' American G.H. Lathe
-42"x18' Putnam Lathe
-60"x20' Fifield Lathe
-12" Sundstrand Production Lathe
-24" Cincinnati Pulley Lathe
-36" Cincinnati Pulley Barer
-Mc. 4 AC LeBlond Crankshaft Lathe
-3"x36" Jones & Lamson Turret
-Gisholt Simplimatic
-16"x8' Flather Lathe -16"x6" Flather Lathe -31/2"x60" Lo Swing Lathes

MILLERS

-Holden & Morgan Thread Miller
-8"x14" P. & W. Thread Mill
-Nube Precision Die Sinker & Duplicator
-2 Spindle Ingersoll Openside Mill
-No. 3 Pratt & Whitney Die Sinker
-Newton 2 Spindle. Vertical Profiler

PRESSES

-15 Ton Metalwood Hydraulic Pneuma. 15 Ton Hercules Power Arbor Press

10 Ton Eastern Hydraulic Press

Hannifin Arbor Press -No. 64 Consolidated Press -No. 31 W-F Presses, Dial Feed

MISCELLANEOUS

No. 0 Ajax Brake Shoe Key Forg. Rolls No. 0 Ajax Brake Shoe Key Forg, Roi
1." Ajax Headers—cont, motion typeNo. 5½-B High Speed Riveter

2 Ton American Vertical Broach
No. 3 LaPointe Broaches (screw type)
Teer, Wickwire Auto. Burr Cutter
Type C Olsen Static 6 Dynamic Bal.
Coulter Auto. Threading Machine
U. S. Eyelet Machines
No. 156 Etna Swagers
No. 156 Etna Swagers
No. 150 2 Buildozer --No. 1 Lefonte Brocks --Ajax No. 2 Buildoser --Higley Cold Saws --Reynolds Screw Driver --Norin Hydro Mechanical Riveter --12'x14 Gg. Toledo Squaring Shear

O MONA

WARASH 0123

400 SOUTH CLINTON STREET

CHICAGO

OUICK

CLEARING CRANKLESS TRIPLE ACTION PRESS

4 Point Suspension Type Combined capacity blankholder and plunger slide 1350 tons Bed 84"x133"

PRESSES-STRAIGHT SIDE

No. 58 NIAGARA, 3½ str.; Bed 21"x22" No. 55 TOLEDO; 1½" str.; G.M.D. No. 73½ BLISS; 2" stroke No. 54 TOLEDO, 6" stroke; G.M.D.

PRESSES-DOUBLE CRANK

O. 97-H TOLEDO DOUBLE CRANK — Distance Between Housings 173"; Bed area 60"x173"; 10" stroke; approx. 650 tons; Weight 245,000 lbs.

ALL MOTOR DRIVEN-TIE ROD

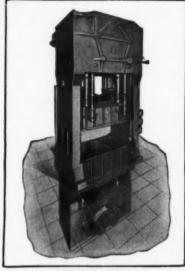
No. 7-C BLISS, 68" Bet., M.D., 734" Strokes No. 85-D TOLEDO, 10" Str., M.D. No. 65-D-84 CLEVELAND, 18" str., 6" shorit, Bed 48x85"; D. B. G.; 16" Die space No. 8-E BLISS, 8" Str. 6 Shorit; 108" Bet., Air Cushions Cushions
No. 154G CLEVELAND, 84" between housings
No. 94-G TOLEDO, 14" Str. 85" bet.
No. 93-E TOLEDO, 12" str. 86 d greg 38x80"
No. 93-H TOLEDO, 12" str.; Bed greg 42"x84"
No. 84-F BLISS, gir cush., 84" between
No. 845½ HAMILTON, 12" stroke; 85" bet.

PRESSES-DOUBLE CRANK-GAP FRAME

No. 205-E TOLEDO, B.G. 4" Str., Bed 72"×26" Nos. 202-D 6 202-E TOLEDO, 5" strokes Nos. 208-F TOLEDO, 87" between housings Nos. 173-B 6 174-B BLHS CONSOLIDATEDS No. 78B½ NIAGARA, 5" str.; 42" opening; Bed 18x51"

PRESSES-TOGGLE

No. 178 TOLEDO Single Crank, 50" bet. housings, 10" Shaft; Stroke of Plunger 26"; Stroke of Elankholder 18"
No. 408B BLISS DOUBLE CRANK TOGGLE DRAWING—84" bet. housings; Twin drive; 25" plunger stroke; 60" die space; 8" shaft No. 1 BLISS; 6" Plunger Stroke



PRESSES-HORN

No. 24 BLISS CONS. B.G. also flywheel type No. 16 BLISS, 2" Str., No. 42 TOLEDO No. C-A-4 FERRACUTE, 4" Stroke No. 204A BLISS; M.D.

PRESSES OBI

No. 6 TOLEDO; No. 6A MARSHALLTOWN Nos. 5½, 5, 6 4 CONSOLIDATEDS NO. 5½ WALSH, No. 4-5 ROBINSON NOS. 5, 3, 6 2½ TOLEDOS No. 4 V 6 O BG., 7" Stroke

PRESS BRAKES

OHL: 10'14 ga.; 6'7/32"; 4'16 ga.; 5'14 ga.; 66" 14 ga. CHICAGO STEEL: 6'14 gg.; NOS. 255 & 335 CINCINNATI-4' 14"

PRESSES-MISCELLANEOUS

PRENSES—MISCELLANEOUS
ARCH: No. 04 LEFFLER, 2" Stroke
No. 09 HOLDEN, 2½" Stroke
OPEN BACK GAP FRAME: No. 75 CONSOLIDATED, B.G.; No. 7 PERKINS, 1½" Stroke4
No. 75 TOLEDO, 3" Stroke; 4" Shair; M.D.
No. 78 TOLEDO, 3½" Stroke; No. 68 WOLD
No. 61 BLISS Reducing; B.G.
ANO. 78-A TOLEDO, B.G.

INTERSTAT

DELIVERY!

MODERN UPSETTERS!

5" AJAX, TWIN GEARED: HEAVY DUTY: M. D. 4" AJAX, TWIN GEARED: HEAVY DUTY: M. D. 3" AJAX. TWIN GEARED; HEAVY DUTY: M. D.

> INSPECTION UNDER POWER PRICED RIGHT BEFORE MOVING!

BORING MACHINE

SNYDER Horiz. 2 way; Hyd. Feed FOOTE BURT 2 Way; Horiz. Boring & Drilling

BULLDOZERS RYERSON KLING DOUBLE END; 14' bed; B.D. WALBURN-SWENSON; 12" stroke; Motor Dr. NO. 4 LONG & ALSTATTER; 10" stroke

RADIAL DRILLS

3' FOSDICE; 6' FOSDICE & WESTERN GRINDERS

DISC: No. 24 Gardner, 53" disc, B.D. ENIFE: 84" PLYMOUTH & 61" SEYBOLD

GEAR MACHINERY
NO. 385 GOULD 6 EBERHARDT
NO. 6-A CINCINNATI, 72"x20" -No. 12 BARBER COLEMAN Gegr Hobbers

HAMMERS

Standard Automatic Drop No. 2—200 lb. 1—No. 4—400 lb. 1—No. 1—100 lb. 1—No. ½—50 lb.

type.

ga.ji

335

SOLI-roke / M.D. WOLD

Board Drop 100 lb. 4 1000 lb. WILLIAMS & WHITE & BLISS

FLOOR LATHES

30 FT. PIT LATHE; FACE PLATE DIA. 156"; QUADRUPLE GEARED; INTERNAL FACE PLATE DRIVE

4/48"x20" SCHUMACHER & BOYE; DOUBLE SPINDLE; Back Geared 2"x22" FIFIELD; 28"x18" DRAPER 4"x15 FT. NEW HAVEN, LCG., Back geared 2"x10" AMER., Gd. Hd.; 21"x10" RYERSON 4"x12" CARROLL JAMIESON URRET: 28" POND 6. 16 GISHOLT SIMPLIMATICS

NEW DIEHL No. 2 TIMKEN BEARING SPINDLES, 1" CAP. BAR FEED, M.D. NO. 4 20" SWING. 2" HOLE, HARDENED

WAYS. WRITE FOR FULL PARTICULARS

SINGLE END PUNCHES
No. 2-HILLES & JONES Horiz. 1"x1"
ROCK RIVER Punch & Shear 14" thr.
No. 15 W. & W. 24" thr. arch. jaw

GANG PUNCHES 10° W. 6 W.; NO. 2 L. 6 A., 74" bet, hage. NO. 5 BERTSCH. 64" between housings BERTSCH-511½" between housings; Motor Dr. 2-NO. 10 WELLS, 1-34" between 1-73" bet.

ROLLER DIE MACHINES 5, 8, 7, 8 & 10 Spindle YODER

ROLLER LEVELERS 50" HILLES & JONES—334" Rolls
5' NILES, rolls \$14"; 27" NILES, \$%" rolls
80" McKAY, 7%" rolls

FRICTION SAWS No. 1, 4 RYERSON, Power Feed

ROTARY SHEARS No. 34M MARSHALLTOWN Lennox Bevel 3/4" No. 10 QUICKWORK; 80" throat 14 ga. cap. No. 3 QUICKWORK; 36" throat 3/16" cap. No. 2A QUICKWORK 10 ga. cap.

SHAPERS 12" NEW HAVEN VERT. SLOTTER 15" BARKER, B.G.; 10" NILES

PIPE THREADERS 12" STANDARD-WIELAND, Cap. 4"-12" 6" SAUNDERS, Landis Die Head

SHEARS 10'14 GA.; 8'14 GA.; 10'18 GA.; 6'18 GA. 8x8x34" LONG & ALLSTATTER ANGLE ROLLS

6' NILES %" cap.; 8' NIAGARA 20 GA. 8x6x¾" WICKES Angle Roll

MISCELLANEOUS MISCELLIAN EOUS
SCRAP BALER: GALLAND & HENNING HYD.;
60"x24"x18", with 30 HP Motor
SEAMERS: No. 108 CAMERON; No. 125 ADRI.
TAPPERS: No. 4 PNEUMATIC GATERMAN;
No. 1 Gurvin; %" cup. Gaterman

Jachinery Co., Inc.

Boring & Drilling Post Mill, 4" spdl., M.D. Bulldozers, W. & W. No. 0, belt bulldozers, D. W. Bulldozers, B. B. D. Lathe, 24"x16" Rahn-Larmon, P.G., Cullman M.D. Lathe, 34"x18" Porter, 5-step cone Lathe, 72", short bed, no tallstock, M.D. Motor, 10 MP. C. W. 230 V. D.C., 1400 Rev., (new)

Motor,

(new)
Plane, 36"x36"x12' Flather, 2-Hda, M.D.
Plane, 42"x42"x10' Flather, 1-rail & I-side
head, B.D. Manville, Pillar, 1500 lb. (2)
Press, No. 2 Magara D.C., 36" betw. bags.,

Press, No. 6 Niagara D.C., 36" betw. baga,
M.D. Press, Poot, No. 18 Famco, on stand
Punch, S.E., No. 7 L.&A., 4" tht., belted md.
Punch, Multiple, Bertsch, 48" betw, haga, MD.
Punch, S.E., No. 1 L. & A., 16" thrt., cap.

14x1"
Reamers, 34", 44", 4-5/16" adj. HB.
Reamers, 54", Adj. HS. Kelly
Riveter, 2-A Hjah Speed for M.D.
Roil, Levelling, 54"x44" McKay, 17-rolls,
3/60/440 (Late, Model)
Roils, Bending, 8"x1" Niles, Initial type, drop
end, cast iron base, belted
shear, Bar, 6"x1" Blacher, 34" blade, M.D.
Shear, Bar, 6"x1" Dulted, 18" blade, M.D.

Shear, Hotary No. 15-A Niag., circling attach. Threading Mach., Auto. 2" Rickert-Shafer, buring & Chamfering tools, M.D. Turret Lathe, 22" Cin-Acme G.H., M.D., chha Welders, Butt 200 & 300 KW. Winfield 60 cr., 400 V.

HYDRAULIC EQUIPMENT

260-Ten Herizontal Upastae, 24" streke, with 110-Ten Vert. Ram, 15" streke, 450-Ten Press, 4-column, bed 30"x48", streke 60", daylight space 84" to 100-Ten Merizontal Buildoze, 36" streke

ELECTRIC FURNACE

000 lb. Swindell-Dressler with hydraulic tilting cylinder, pump, motor and three 200 kVA, Transformers 22,000 V. pri-mary, 90 volts secondary. Used on ex-perimental work. Immediate shipment 1000

ROLL LATHES

84"x20' Standard, compound Geared Head, for direct motor drive, with plane and necking rests. Used little. Fine condi-

2"x20'United, 4-step cone, with giane and necking rests and countershaft. Good condition Both for Quick Shipment

ALBREATH MACHINERY

306 EMPIRE BUILDING

PITTSBURGH, PA.

MOSER'S HIGH GRADE TOOLS

Miller, No. 2B Kearney & Trecker Plain Miller, No. 4 Becker Brainerd Vert., M.D.

Grinder, Sanford Centerless Grinder, 8"x24" W. & M. Surface

Grinder, No. 60 Heald Internal

Grinder, No. 65 Heald Internal Grinder, Model 81, Type B 14"x36" Norton Cronkshaft

Grinders, Ingersoll Tub (2)

Boring Mill, 25" Niles Vertical with turret head on rail

Turret Lathe, 28" Gisholt, 31/4" hole in spd. Screw Machine, Pratt & Whitney, 1" cap. A.C. & B.F. collets B.D

Auto. Piston Turning Mach., No. 2P P & J Radial Drill, American 3' Sens., B.D.

Drill, No. 10-16 Spdl. Bausch

Lathe, 9"x6' South Bend L.C.G. Lathe, 28"x12' Fay & Scott, L.C.G.

Press, 300 ton Wellman-Seaber-Morgan Tire

Press, 100 ton Hydraulic Press Co. Tappers, Harvey Hubbell Horiz., B.D.

Tapper, 1/4" Tuttle Vertical

Bolt Cutter, 11/4"

Squaring Shear, 36" Kutscheld Ft. Power Riveter, No. 1A High Speed

Die Sinking Machines, Keller E-6 Mech. (3) Thread Millers, Waltham B.D. (2)

Bolt Cutter. 4" Acme B.D.



MOSER MACHINE TOOL SALES — 1608 W. Clybourn St., Milwaukee, Wis. 7 0

igly

m

en

all p

rai

rex

dis

the TER VD 4[0] tab

the



MACHINERY DEALERS NATIONAL ASSOCIATION

Is uniting the efforts of Government, Machinery Users and Dealers—for the mutual benefit of all

SNA Helps The Dealer

r collecting and distributing openly and ity all information that will be helpful member firms. Already Dealers have en saved thousands of dollars through prompt cooperation of MDNA.

informing members of governmental

opposing unfair business methods and scriminatory practices of every kind.

adopting a long range program to as public attention on the contributions the industry to the war program.

PERY RELIABLE FIRM IN THE USED NO REBUILT EQUIPMENT INDUSTRY GOLD BE A MEMBER OF MONA. Tablish yourself as a member of this

sat industry by joining MDNA. For ther information write the secretary.

MDNA Helps The Government

The Association through the united efforts of its member firms is aiding the war effort of the government. The industry through its national association is proving itself invaluable to the war effort.

MDNA Helps The Machinery User

The MDNA emblem guides the machinery buyer to responsible and reliable firms. He can buy with complete confidence; realizing if any difficulty should arise he can take it up with the Association and be assured of satisfaction. He can rely on member firms for fair appraisals on his machines. The Association is con-

machines. The Association is constantly on the alert to stamp out any unfair business practices.

ACHINERY DEALERS'

MDNA

NATIONAL ASSOCIATION

IMMEDIATE DELIVERY

Satisfaction Guaranteed

14"x9"x12" BURY AIR COMPRESSOR 2-stage horiz., water cooled with inter-ceoler, flat belt, idler and parts; 100 h.p., 3 ph., 60 cy., 220 volt motor with resistance grids, controller and base, 48"x8" ASME roceiver with pressure gauge, safety & drain valves

DRILLS

21" Cinc. Bick. Box Col. Prod., m.d. & m., p.f. to spdl., 2 Buhr adi. hds. Fox Mult. Spdl. with tap. att. (6)
Eingsbury 4 spdle.,
auto. index device
21" Rockf. Drills (2) 21" Minster Drill Natco Rot. 6-spdle. 5-Spdle. Detroit Foote Burt Mult. Sp. Drill m.d. (5) Western Radial

Drill, heavy duty GEAR EQUIP. No. 365T Gould No. 36ST Gould & Eberh. Gr. Gash. W. & W. Gr. Cutter, 96" dia. x 52" fa.

GRINDERS No. 1 Osterholm fa. No. 126 Gardner dbl. spdl. hyd. id. No. 20 Bryant Int. 12"x36" Cinc. Pl.

LATHES 34"x11' Wickes 34"x11" Wickes Crankshaft, (2) 13x5" Pratt & Whit-ney, motor drive

Cyl.

MILLS No. 3 Craftsm. Ret. Production Trundle Thrd. (3)

PRESSES S.S., 41/2" cr.

No. 62 Bliss Open Bk., long str., (2) No. 4 Adriance, O.B.I.

No. 4 Toledo O.B.I., motor drive Nos. P-2 & P-3 Ferracute, g.m.d. (6)

MISCELLANEOUS

Bolancer, 18" Gis-holt Static (2) Boltcutter, Nat'l. 2-spdle., 1½" cap. Broach, 6-ton Amer. Vert. Hyd. m.d. Buildozer, No. 5 Williams & White Core Blowers, No. 6 Demmler, (3) Hummer, Brudley

15 lb. Rivet Heaters, Berwick (4) Riveting Hammer, No. 5A High Sp. Riveters, Town-send, 7" thr. (3) send, 7" thr. (3) Slitter, 42" Yoder Trucks, Elwell

Parker Elec. Mule ton Auto. Hi-Lift Bolt Thread., Acme Shear, 5' 3/16" Rlins

Upsetter, 11/2" Acme Steel Bed Upsetter, 1½" Alax Wire Strars., 3/16" Shuster to 20' (6) Gen. X-Ray Mach Ray Mach., Ge Elec. 250,000 2%" solid steel Roll Former. Hend-

ley & Whittemore, m.d. & m. JUST RELEASED



250,000 VOLT GENERAL ELECTRIC X-RAY MACHINE

Lead lined. Will X-ray boiler plate up to 2" thick. Overall dimensions: Length 102"; width 84"; height 88"

HENDLEY & WHITTEMORE 20A BELOIT ANGLE BENDING ROLL

Arranged geared motor drive with m tor, Initial type, Capacity 2x2x1/4"

100 TON HYDRAULIC PRESS Bed 36"x53". Motor driven. Vickers

pump & tank unit. Feed rolls and conveyor synchronized to press

SLEEPER & HARTLEY SPRING COLLERS No. 2; Ser. 332 Univ. Clutch, m.d. (2) No. 1; Ser. 348 Univ. Clutch, m.d. & m. No. 1 Series 258 Universal Segment Type, No. 3 Series 251 Univ. Segment Type, md. No. 3; Ser. 434 Univ. Seg. md. & mt.

WRITE . WIRE OR PHONE

9656 FRENCH ROAD, DETROIT, MICH.

Good Used Machinery

BANDSAWS (METAL)-Klemm & Atkins

BOLT MACHINES—Acme 1-Sp. 11/4" cap.; National 1-Sp. 3"; Acme 2-Sp. 1" cap.

BORING MILLS—Bullard 51" Vert., 2 hds.; Colburn 42" one head; Mach. Tool 3" Hariz.

BRAKES—Keene 10' 16 ga. Toggle Press; D K 10' 14-ga.; D & K 8' 18-ga. Hand; Robinson 5' 3/16" cap.

COLD SAWS—Newton 9" cap., Cochrane & Bly No. 2-B; Higley No. 14

CUT-OFF MACHINE-Davis 6" cap.

DRILLS (RADIAL)—Carlton 4' all gear box dr.; Hammond 4' sensitive; Dreses 4' C.D.; Bickford 4'; American 5'

DRILLS (H. S. B. B.)—H & W 2, 4, 5sp.; Sipp 1 & 2 sp.; Allen 2; Avey, Demco, Lel-Gif. 1-sp.; Avey 2-sp.; Avey 6-sp.

DRILLS (MISC.)—Rockford 20" Heavy Grd. Feed; Barnes 20" & 24" 1-sp. & 20" 4sp.; P. & W. 24 sp. rectangular head Adj.; Moline 4-Sp. Hole Hog; Colburn 20" S.P.D.; Barnes 25" Grd. camel back Baker Style F; Weigel 23" T. Attach.

GEAR CUTTERS—B & S 26" s. p. d. auiomatic spur; Cincinnati 36" gear cutter. B. & S. 48"x10"; G. & E. 48" gear Cutter; Fellows No. 3 Gear Shaper

GEAR GRINDER-Lees-Bradner

GEAR HOBBER-Farwell No. 1

GRINDERS—P & W 12" vert. surf.; Heald Nos. 50 & 65 Int.; Badger No. 220, auto. d.e., opposed disc (4); Cinc. 12x36" pl.; Modern 12x24" Pl. External; Heald No. 55 Int.; Walker Rot. Mag. Chuck Surf.; Diamond M.D. Horiz. Surf. HAMMERS—Mayer 50-lb.; W & W 165 lb.; Kane & Roach 70 lb.; Beaudry 150 lb.; Bradley 200 lb. Upright Helve; W. & W. 125 lb. Air

LATHES—Monarch 16"x10" M.D.; Lehmann 18"x9"; L & S 20"x10"; S-B & E 20"x10" q.c.q.; Flather 22"x10"; Monarch 16"x8"; Q.; Ryerson 20x10, m.d.; S.B.E. 30"x12" Q.C.G.; Sidney 18"x8"; S. Bend 16"x8"; Maine 26"x14" Q.C.G.; Putnam 26"x14"; Prentice 24"x12" G.H.; L. & S. 16"x8"; Grd. Head

MILLING MACHINES—Owen Duplex; Ohio No. 24 Plain; B & S No. 12 Mfg, Type; Bilton No. 25; Ingersoll 2-sp. vertical; P. & W. Mfg, Type; Becker No. 25 Pl.; G. & E. Vert. Rotary Table

THREAD MILLERS-Moline No. 10

PLANERS—Pond 32"x34"x10"; Pease 26"x 26"x9"; Cincinnati 36"x36"x10' 2 Hds.; Gray 24x24"x6"; Cinc. 24x24x6'

PIPE MACH .- Oster 6"; B. & K. 12" cap.

PUNCH PRESSES — Ferrocute No. P.4; Barouth No. 4 O.B.I.; Bliss No. 62; Toledo No. 31 & No. 32 Swaine No. 38 crch; Bliss No. 21; Bliss No. 18 6 No. 19 O.B.I.; Cons. No 2½ O.B.I.

SHAPERS—G & E 20"; S & M, Q. City, Rock., Cin. 24"; American 24" heavy, b.g.; S & M. 26", b.g.; Amer. 20"; Rockf. 24" gearbox; Stockbridge 26"; Am. 16"; Cin. 24"

SCREW MACHINES-4-Hand

SQUARE SHEAR—D & K 36" 14-ga. steel; Niagara 36" 14-ga., 10' 18-ga.

SLOTTER—Barr 12"; Niles 12" P. & W. 21/2" Str. Vertical Shaper

TAPPING MACHINES—Vertical Automatic Garvin No. 1 & No. 2

TURRET LATHES—Colburn 30" Vert.; B & S Vert. 38"; Superior No. 3; P & J 2" cap.; Gisholt 21/4" cap.

Above is only a small part of our large stock on hand





HIGH GRADE TOOLS

LATHES

42"x14' Niles Engine Lathe, Standard change gear, cone drive

42"x16' Niles H.D. Lathe, Loose Change Gear, Cone Drive

28"x50"x16' Rahn Larmon Sliding Bed Gap Lathe, Three step cone drive, Double Back Geared, Quick Change Gear Box

16"x8' South Bend, Gap type bed, Cone drive

PLANERS

60"x50"x18' Betts Planer, Belt Drive, One rail head, One Side head. 32"x32"x18' Gray, with 2 heads, belt drive

30"x30"x8" New Haven, One head, belt drive

24"x24"x6' Cinc. Planer, Belt Drive

RADIAL DRILLS

3' American Sensitive, Belt drive 6' American, S.P.D. box table

GEAR MACHINERY

No. 5-60" Brown & Sharpe Gear Cutter, Belt drive

No. 3-26" B. & S. Gear Cutter No. 1 Adams Farwell Gear Hobber

No. 1 Adams Farwell Gear Hobber No. 1 Schuchardt & Schutte Gear Hobbers

No. 3 Adams Farwell Gear Hobber 18H Gould & Eberhardt Hobber 24" Rhenania Gear Hobbing Mach.

96" Williams & White Gear Hobber

SHAPERS

16" Rockford Cone Drive

GRINDERS

No. 50 Heald Internal Cylinder Grinder, Hydraulic No. 55 Heald Internal Grinders No. 60 Heald Internal No. 70 Heald Internal Grinder 10"x36" Norton Plain Grinder 16"x72" Landis Plain Grinder, M.D. 14" Pratt & Whitney Ball Bearing Spindle, Vertical type

No. 5 Oliver Drill Grinder M.D.

MISCELLANEOUS

Quickwork Rotary Shear
No. 1 Klemm Metal Band Saw
Atkins Metal Cutting Back Saw
25 lb. Beaudry Belt Dr. Hammer
100 lb. Beaudry Belt Dr. Hammer
1500 lb. Bell Steam Hammer
No. 1 Baker Keyseating Machine
2" Acme Bolt Cutter
No. 1 LaPointe Broaching Machine
2" Landis Pipe Threading Machine
20 spindle No. 2 M.T. Natco Drill
No. 2 Bausch Multiple Spindle Drill
1" Roller Pipe Cutting Machine
Savage 3/16" Nibbler
Savage 3/8" Nibbler

CINCINNATI MACHINERY & SUPPLY CO.

217 EAST SECOND STREET

CINCINNATI, OHIO

•

B

For Immediate Delivery

LATHES

Lodge & Shipley-16"x8' Q.C.

Davis-16"x8' Q.C.

Monarch-16"x8' Q.C.

Sidney-16"x8' Q.C.

Hamilton-16"x14' Q.C.

21"x10' LeBlond G.H. Crank-

shaft Chard—22"x10' Q.C. Hvy. Duty

Prentice 38"x18' G.H.

TURRET LATHES

Woods Tilted Turret-1%"

GEAR CUTTERS

26" Brown & Sharpe

36" Fellows

G. E. 3x36 Spur

G. E. 18" Spur & Bevel

* AUTOMATICS

Gridley 21/4-31/4-41/4

Cleveland 21/4" single spindle

" Cleveland %", four spdl., M.D.

MILLER

Becker No. 2 Vertical

GRINDERS

EPTEMBER 1942

Cincinnati Tool & Cutter Grdr.

Brown & Sharpe No. 16 111/2"x72" 2—12x24 Cincinnati Universal Grinders

10x24 Landis M.D.

SHAPERS

14" Chase

16" Barker

RADIAL DRILLS

6' Prentice Geared Box M.D.

1—four spindle, ball bearing Allen Drill Press

24" Snyder Sliding Head Drill Press

2—Foote Burt Heavy Duty Drills

36" Car Wheel Boring Mill

MISCELLANEOUS

Oeking 4x4 Angles Punch & Shear

Binsee Horizontal Boring Mill 2"

1000 lb. Chambersburg Steam or Air Hammer Single frame

No. 3 Lees Bradner Thread Miller

No. 12 Pratt & Whitney Profiler

10" & 12" Slotters-Newton

This is a partial list.

We buy and sell complete plants. Send us your requirements.

S. & S. MACHINERY CO.

207 Centre St., New York, New York

HUNDREDS OF MACHINES READY FOR SHIPMENT

P. & W. Nos. 11, 12, 13 Mult. Upright Drills—many makes and sizes

GRINDERS

Landis 10"x24" Plain Grinder Farrel Roll Grinder Landis 12"x32" Plain

Bullard 26"x14½"
Niles 28"x10"
McCabe 26" and 42"x14'—2 Spindle
Fifield 36"x10"
Fifield 32"x25'
Lo-Swing "4"x108"
Niles 28"x11'
Putnam 36"x22'

MILLERS

Pratt & Whitney Lincoln Millers Garrin Duplex Lece-Bradner No. 3B Thread PRESSES V. & O. No 12, 14 D.A.C. In. Ferracute No. 105 D.A. W-F Type for cartridges (29)

Danville 4" Stroke Cut Back Frame Shear W-F 30 Ton Cap. Rack & Pinion, for shells

Cleve. 1", 4", 1", 1", 11, Auto. Potter & Johnston Nos. 5A, 6A Chuckers New Britain No. 23, 24 Chuckers Goss & DeLeeuw 6"x62" M.D. Chucker

MISCELLANEOUS

Broaches, LaPointe 1-2-3 Burnisher—Fellows Gear Tooth Cam Cutter—Manville Degreaser—Colt Autosan No. 21 Die Sinkers—Keller Die Singers-Aeier
Driller-Enterprise Rotary
Gear Generator-Lees-Bradner No SA
Gear Burnisher-Fellows
Gun Barrel Machinery-Reamers & Drillers
Hammer-Standard 800 lb. Automatic
Hammers-Chambersburg 1500 lb. Stee Hammers—Chambersburg 1500 in. Steam Drup (4)

Headers, many sizes & makes Planer—Pond 30x30x60x11

Planer—Pin. 12"x60"x12".—3 Head Planer—In. 12"x60"x12".—3 Head Steam Steam

BOTWINIK BROTHERS, INC.

353 Welton Street,

New Haven, Conn.

NOW AVAILABLE

LATHES
16"x8" Flother—T.A.—Plain Relieving

Attach. Attach.
16"x8" LeBlond—T.A.
28"x14" S & B.—QC.—DBG.
34"x16" S & B.—DBG.
34"x16" S & B.—DBG.
35"x17" Pond Belt Drive
42"x15" Pond Belt Drive
44"x18" S & B Belt Drive

MILLERS 2-No. 11/2 Rockford Plain No. 12 Garvin—Hand

> SHAPERS 24" Cin. BG. 24" Kelly—BG. 24" Rockford—CSMD.

PLANERS 30"x30"x8" Pond—1 head 30"x30"x8" Gray—1 hd.—Arr. c.s. 28"x26"x28" Cinc. Crank Planer 1 Cinc. Crank Planer MD. 800 lb. Chambersberg Single Frame Steam Hammer 2-1500 lb. Bement Single Frame Steam 4000 lb. Bement Double Frame Steam

Hommer 100 lbs. Bradley Upright Strap 300 lb. Beaudry Champion

UPSETTING MACHINES 3—11/2" Acmo 11/2" Ajax 3" Ajax

MISCELLANEOUS

10"x20" Landis Universal Grinder No. 2—LaSalle Surface Grinder No. 652B—Oster Pipe Cut off Machine M.D. 8" Williams Pipe Machine SPD. 11½" Cap.—"D & K" Alligator Shea 66"—14 Ga.—P.S. & W. Shear.—M.D.

DEAN

542 W. Washington Blvd.

Chicago, III.

VICTOR OUR NAME—VICTORY OUR BUSINESS

%" Cleveland Model A. M.D.
114" Cleveland Model A. M.D.
34" Gridley, 4 spindles
44" Cleveland Model A. Boring Mills
Boring Mills 42" Bullard 2 Heads
Boring Mill, 3" Binsee Horizontal
BROACHES
BROACHES

BROACHES
25 LaPointe Hydraulic, M.D.
No. 1½ and No. 3 American Horizontal
DRILL PRESSES

No. 23 Foote Burt No. 10 Defiance, 4 spindle GRINDERS

No. 33 Abrasive, M.D.
12x88 Landis Cylindrical
No. 60 Heald Internal
Ott 8"x16" Cylindrical
Grinder, 16"x48" Landis Crkshit. self-cont.

Gear Hobbers, No. 12 Barber-Colman Hobber 16 H.S. Gould & Eberhardt No. 1 Lees-Bradner Production Hobber LATHES

17x8'LeBlond, Quick Change Gear 18x8 Mueller, Quick Change Gear Lathe, 21"x10 LeBlond q.c.g. 24"x14 Boye & Emmes, Q.C.G. Lathe, 25"x10 LeBlond Grd. Head Lathe, 25"x16' Endgeford q.c.g. Lathe, 38"x14' Lodge & Shipley q.c.g. Lathe, 4AC LeBland Crankshaft
MILLING MACHINES

2A Milwaukee, S.P.D. No 2 Cincinnati Plain No. 4½ Becker-Brainerd Becker Lincoln Miller

PRESSES
No. 3 Verson O. B. L.
No 4H Cleveland Horn
No. 23 Bliss Cons. Horn
No. 16 Bliss Horn

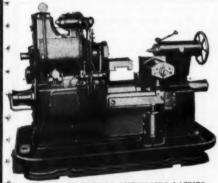
PUNCH PRESSES
No. 90B Toledo Dble. Crank
No. 163½ Toledo Toggle
No. P-1—2—3—4 Ferracute (10)
SCREW MACHINES

2—No. 1 Foster
2—No. 2 Foster
4—No. 3 Foster
No. 2 Profit & Whitney
SHAPERS

16" Whipp M.D. 16" Milwaukee B.G. 28" Smith & Mills B.G. SHEARS

No. 172 Niagara
Nos. 2 & 3 Doelger & Kirsten Alligator
14' Garrison 1/4" cap. M.D.
MISCELLANEOUS

Davis & Thompson Piston Drilling Machs. Dieing Machine, 50 Ton Henry & Wright Worm Generator, 24" National Hyd. M.D.



TWO NO. 17 BARNES AUTOMATIC LATHES

Swing—over front cross slide . . . 13". Swing—over rear cross slide . . . 17". Swing—over carriage bar . . . 26". Distance from tailstock center to face of spindle nose . . . 20", Speed Range (8 speeds) . . . 30 to 375 RPM, Feed range . . . 001" to . 100", hole thru spindle . . . 1½", Spindle taper . . . 3½" per foot—3½" diameter, Height of spindle center from floor . . . 41", Travel—Front carriage (standard) . . . 8", Travel—Rear carriage (standard) . . . 6", Speed main drive shaft . . . 600 RPM, motor driven with 10 HP 3/60/440 motor, wt. approx. 6500 lbs., Our machine equipped with quick acting tailstock.

MUNA

VICTOR Machinery Co.

130-132 South Clinton St., Chicago, Ill.

WANTED

YOUR LIST OF SURPLUS MACHINERY

Help us to find the Equipment Your Country Needs

SEND US YOUR LIST TODAY.



FRYE MACHINERY SALES CO. 32 NO. CLINTON ST., CHICAGO

Special Announcement

OUR CATALOGUE OF SMALL PRODUCTION TOOLS FOR MACHINE SHOPS IS OFF THE PRESS

SEND FOR A COPY

TRAVERS TOOL CO.

5 COURT SQUARE

LONG ISLAND CITY, N. Y.

60-72"x27' Niles Lathe 6A A 7A Potter-Johnston Turrets

DRILLS-24" Foote-Burt, 20" Worcester GEAR CUTTERS-1-No. 5-60" B. & S. No. 3-26" B. & S. GRINDERS-No. 20 Bryant Int.

53" Gardner Disc LATHES-1"x18" P & W. Auto.

3"x60" Lo Swing 34"x18' Barrett, gun boring T. R. WIGGLESWORTH MACHINERY CO., 36"x18' Putnam Lathe Ord. Hd., M.D. 16"x72" Norton Crankpin Grinder

MILLERS-1-Hendey Lincoln Type, 1-No. 1 Garvin Hand, No. 2 Cinn. Plain

PRESSES-1-P-3 Ferracute

MISCELLANEOUS-1-1"x1" Punch & Shear Model A Cleveland I" Auto.

Portable Keyway Slotter, 4' Stroke 1-10"x10" & 6"x6" Marvel Hacksaws 1721 Superior Avenue, CLEVELAND, OHIO



Buy U.S. WAR SAVINGS BONDS 🖈 🖈 AND STAMPS

HILL-CLARKE QUALITY

BROACHES

No. 4 J. N. LaPointe

DRILLS

No. 1-1 spdl. Leland-Gifford

1 spdl. Henry & Wright

2 spdl. Leland-Gifford Bench

2 spdl. Avey

2 spdl. Henry & Wright

4 spdl. Sigourney

4 spdl. Henry & Wright

4 spdl. Woodward & Rogers

6 spdl. Henry & Wright

No. 3 Baker 2 Spdl. Cyl. Borer

GEAR CUTTERS

No. 4-48" Brown & Sharpe

No. 60 BM Gould & Eberhardt Bevel Rougher (2)

GRINDERS

See Page 390
Hill-Clarke Cylindrical Grinders

22"x96" Norton Plain, Motor Drive, Roll Form, Attach. No. 40 Bryant Wide Wheel, Oscillating

No. 60 Heald Cylinder

No. 10 Lees-Bradner Spur Gear Grinder

11/2" New Yankee Drill Grinder

MFG. LATHES

3½"x60" Fitchburg Lo Swing No. 4AC LeBlond Auto. Crankshaft

SLOTTER

10" Newton

TURRET LATHES

No. 3-F Foster Fastermatic, Platen Type (2)

No. 3-F Foster Fastermatic, Indexing Type (2)

MISCELLANEOUS

12" Bignall & Keeler Pipe Machine

No. 11 Cochrane-Bly Saw Sharpener

No. 4 Gaterman Pneumatic Tapper, 5/16" Cap.

HILL-CLARKE MACHINERY CO.

645 W. WASHINGTON BOULEVARD, CHICAGO

National Red Ring Gear Lapper, m.d.
American 3' Sens. Radial Drill, cone drive
Detroit 5 Spindle Horizontal Drill
Lapper, Bethel-Player No. 1-F
Lapper, New Frazer
Lapper, No. 1 vertical
Reller No. E-3 Engraving Machine
No. 12 Barber Coleman Gear Hobber (3)
Gear Tooth Roundar, National Red Wing. Gear Tooth Rounder, National Red Wing, M.D. Fellows 24" Gear Shaper Grinder, Osterlein horizontal Erie 800 lb. & 1000 lb. Steam Hammers Univ. semi-cuto. spline Grinders (2) Mitts & Merrill No. 2 Keysecter J & L 3x36" Turret Lathe Monarch 14"x6" Q. C. Lathe American 14"x6" Q. C. Lathe with taper American 14".8" Q. C. Lathe with taper attachment
Bradford 24"x12" qk. chg. Lathe
LeBlond 18"x12" qk. chg. Lathe
Milwaukee 22"x10" loose chg. Lathe
Milwaukee 28"x10" loose chg. Lathe
Hilwaukee 28"x10" Semi Q.C. Lathe
Heald No. 70 Internal Grinder
Norton 18"x35" Plain Cyl. Grinder
LaSalle No. 2 Suri. Grdr. mag. chuck
Rockford No. 2½ Plain Miller, vert. attach.
Cincinnati Power Press Brake, 3'x16", cap.
¼" M.D.

Miller, Ohio 48" production Press, Bliss No. 20 Inclinable Press, Toledo 90-E straight side 42" be-tween uprights M.D. Press, L 6 J No. 2 Inclinable M.D. Fress, L & J No. 2 inclinable M.D. Press, Flexible 3-ton power Riveter No. 6-B high-speed Gleason 16" Quenching Press Kling No. 4 Sgl. End Punch 15" throat, gd. Williams 6 White No. 13 Single End Punch. Williams & White No. 13 Single End Punch.
36". qd.
New Doty No. 17-B Sql. End Punch
Bertach Multiple Gang Punch 36". M.D.
Gishelt Clutch Balancing Machine
Gishelt Crankshaft Balancing Machine
Bertach 10" power Squaring Shear, cap.
18-qa. M.D.
National 42" qrd. Power Squaring Shear,
5/18" cap., 8" qap, M.D.
Gleason 4" Spiral Cutter Sharpener
Tapper, Gaterman No. 8 M.D.
Gaterman No. 8 A. Muomatic Oscillating
Tapping Machine (3)
Fellows No. 4-T Thread Generator Tapping Machine (3)
Fellows No. 4-T hread Generator
Gleason 8" Spiral Bevel Gear Generator
Taylor-Winfield Butt Welder
Federal Spot Welder 10 EW, auto. M.D.
Gear Hobber, Adams No. 1 (3)
Brake D & K 6"-16-qauge
Roll, Beloit No. 4-A, capacity 3/18"

F. W. BURNS MACHINERY

1441 NORTH THIRD STREET.

1/4" M.D.

MILWAUKEE, WIS.



MOREY Dependable Used Machines

La POINTE No. 2 two spindle Broach-MD. ROCKFORD No. 2 Horiz. Boring Millfloor type—M.D. G. & E. 48" Gear Cutter WHITON No. 15 Auto. Goar Cutter INGLE 12" Gear Tooth Rounders GLEASON 37" Bevel Gear Planer GLEASON 18" Spiral Bevel Gear Gen. GLEASON 6"-11"-18" Bevel Gear Gens. LEES BRADNER No. 5A Gear Generator

BLANCHARD No. 18A Automatic Surface Grinder-Hand feed

LANDIS 31/2" Internal Hyd. Race Grinder LANDIS 16"x36" Plain Cyl. Grinder-M.D. NORTON 14"x50" Plain Grinder-M.D. HEALD No. 60 Internal Grinder NORTON 16"x50" Crankshaft Grdr .-- M.D. GARDNER No. 6 Dbl. End BB Disc Grinder P. & W. 6"x132" Thread Miller AUTOMATIC MCH. CO. 12x4' Thrd. Lathe BRIDGEFORD 27"x18' Boring Lathe P. & W. No. 12 Multi-Spindle Drill NATCO C-13 Hyd. Multiple Spindle Drill NATCO C-11C Multiple Spindle Drill BLISS No. 31 Power Press ESPEN LUCAS No. 138 Cold Saw-Cap. 12" Round NEWTON No. 197 & No. 200 Cold Saws COCHRANE & BLY No. 5 Cold Saw COULTER 2 spindle Diamond Borer-M.D. LANDIS 4" Single Head Bolt Cutter ACME I" All Steel Upsetter AJAX 3" All Steel Upsetter SAUNDERS 8"x18" Pipe Threader TREADWELL 12" Pipe Machine KELLER E3 Auto. Profiler (Die Sinker)

GISHOLT Precision Balancing Machine

HEW YORK

THIS IS A PARTIAL LIST-Write us your specific inquiries.

REY MACHINERY

410 BROOME STREET

20

EPT



Snyder Twin Ram Master Hyd. Feed Motor Driven Boring and Drilling Machine

NO. 3 BRYANT HEAVY DUTY SEMI AUTOMATIC HOLE GRINDER, M.D.

DRILLS

24" Barnes Camelback, All No. 2 Becker Vert. Grd. Self Oil. S.P.D. No. 0 Bristol Hand No. 210 Barnes All Grd. Self 12" Cinc. Mfg. Type Grd. Self Oil. S.P.D.
No. 210 Barnes All Grd. Self
Oil. S.P.D
1 & 2 Sp. Demco. H.S. B.B.
4 Spdl. Henry Wright
4 Spdle. Allen M.D. No. 2
M.T.

M.T. Spdle. Avey No. 1½, H.S. B.B. M.D 1 Sp. Allen, T.A. No. 1 Lel. Gif. Bench, T. A. 3' Taylor & Fenn Sens. Rad. 20" H.D. Mig. Type No. 5

No. 2 Gardner Disc No. 1 Norton Univ. T & C. GRINDERS No. 1 LeBlond Univ. To No. 1 Micro-Honer, M.D. No. 55 Heald Cylinder No. 23 Baxter D. Whit. Whit. Int.

LATHES 20"x12" L & S Q.C.G. Arr. M.D. T.A. No. 1 Foster Pl. Hd. Turret 9x18" Porter Cable Stub 21/4x24" J. & L. MILLING MACHINES

12" Cinc. Mfg. Type No. 5 Hendey Lincoln Type (2)

No. 12 B. & S. Plo Plain

No. 6 Wat. Far. Toggle Pillar, 120 Ton Geared lar, 120 Ton Geared
No. 21 Bliss Knuck. Jt. Emb.
& Cag. Grd.
No. 42 Swaine Arch Type,
No. 731/2 Bliss S.S. Flywheel
Profiler, No. 12 R-P 2 Spdle. lar,

No. 3 Bliss Stiles, Grd. No. 4 Bliss Stiles, Flywheel No. 50 Wat. Far. OBI. Flyw. (4)

No. New

Forcing

Auto. Mod. F Grid. 34", 4 Spdle. S.P.D.

Auto. Mod. B Cleveland %" Sgl. Spindle

Comp. 8x8" C.P.T. Hor. Air Die Filer, No. 5 Thiel, m.d. Gear Hob., No. 3 Adams Farwell Auto.

Gear Hob., No. 12 Barber Colman

Plate rolls, 10' Long, 6" dia. Riv. Hmrs. Nos. 1½B, 3A H.D., 4A Motor Dr. & 5A High Speed

2 Delde All Steel O.B.I., Saw, 6x6" Racine Hi Speed Saw, 8" Higley Coldcut, MD. New No. 3 L. 6 A. Grd. Punch, Saw, No. 2 Klemm Band, 6" Throat Hyd. Motor Drive

Scleroscopes, Model "D" Shore

Tester, Brinnel Hardness Welder, 20 KW Ace Spot

George M. Bernstein & Co.

CHICAGO.

MURCHEY NUMBER 2 SEMI-AUTOMATIC DOUBLE HEAD NIPPLE AND PIPE THREADING MACHINE



THE REEVE-FRITTS CO. 28 N. CLINTON ST. CHICAGO, ILL.

USED

N N 2

2:

2

N

20 45

N

17

18

24

24 53 10

N

G

24

16 30 24

H

Capacity 1/2" to 2" pipe Automatic opening die heads 4 step cone, 33/4" belt Weight 3200 pounds 10 sets 11/4 chasers
7 sets 11/2 chasers
6 sets 2 chasers 3-2° pipe reamers 1-1½ pipe reamer Floor space 4'x6'

MISCELLANEOUS MACHINES

Boring Mill, Newark Horisontal, 2½* bar. Grinder, 24* Sterling wet tool Grinder, No. 11 Lumsden B. B. tool & face Grinder, 26* Buffalo Knife, type A Punch & Shear No. 7 L & A. single end, M. D. Saw. shop, No. 1 Racine H. S., 6*36* Tapping Machine, No. 1 Garvin vertical

RECONSTRUCTION MACHINE TOOL CORP.

REBUILDING PLANT

Office and showroom-199 CENTRE ST., NEW YORK, N.Y., WOrth 4-7960 WIRE, PHONE, WRITE

> Partial listing-send us your inquiries - all machines can be rebuilt and motorized to your specifications.

BORING MILLS

Bullard Vert. Bor. Mill 51" & 42" Colburn Vertical Boring Mill 42"

PLANERS

Betts 60x60x24, 2 heads on rail Sellers 72x72x20, 4 heads

MILLING MACHINES

No. 3 Brown & Sharpe Universal No. 13 Garvin Plain No. 3 Hendy Universal No. 5B Becker Vertical Milling Machine

TURRET LATHES 2 Warner & Swasey

3x36 Jones & Lamson, geared head 2 No. 3A Warner & Swasey 2x24 Jones & Lamson, geared head Libby 71/2" Hollow spindle chucking lathe

GRINDERS

2 No. 3 Modern Cylindrical Grinders No. 12 Brown & Sharpe Tool & Cut. Grdr.

No. 2 Walker Tool & Cutter Grinder No. 52 Hydraulic Internal Grinder 14" Pratt & Whitney Ball Brg. Vert. Grdr.

SHAPERS

24" Gould & Eberhardt 24" Cincinnati 16" Gould & Eberhardt

LATHES

32"x16' Putnam 28"x12 Schumacher 16"x6 Hendy 16"x6 Flather

PRESSES

Bliss No. 4 Bliss No. 0

16" Steptoe

DRILLS

36" Putnam 18" American tool works Combination Drilling, Milling & Bor. mach. 4' Universal radial drill

IS THE TOOL YOU WANT HERE?

4'x1/4" Cincinnati Series 40-4 press brake with large

BROACHES

Nos. 1 & 3 Lapointe

No. 3 American rack type

No. 3 J. N. Lapointe double 2 ton American vertical No. 2 Standard broaching screw press

UPRIGHT DRILLS

UPRIGHT DRILLS
20", 22", 25", 26" W. F. &
J. Barnes
21" & 24" Cincinnati
21", 25" Superior
22" & 28' Aurora

26" Bickford 26" Hoefer

HEAVY DUTY DRILLS 22½" Barnes 4 spindle gang 24" Barnes, All Geared

GEAR MACHINERY
No. 18H G. & E. Auto Univ.
Gear Hobber
No. 3 Barber Colman hobber
8"-10" No. 1 Lees Bradner

Production hobber 14", No. 5A Lees Bradner hob. 26"x8" No. 3 Brown & Sharpe

automatic
36"x6" G. & E. automatic spur
*48"x10" No. 4 B. & S. auto
National Tool Co. gear check-

er, Model B
spindle Lipe Chamferer Pratt & Whitney worm grinder 15" Gleason bevel gear quencher

GRINDERS, MISC. 17"x36"-48" Norton hyd. crank pin. type B Model 184 18" No. 2 Gardner disc 18" No. 84 Gardner opposed 24" No. 8 Badger disc 24", No. 4 Gardner disc 53" Gard. Horiz. disc No. 24 10"x50 Norton cam 10"x50 Norton cam
P. & W. worm or thread
No. 1 Sellers tool grinder
Gisholt Tool Grinder
24" Ingersoll tub type
16" Norton snagging
30" Barson slagging

30" Ransom elec. snagging 21/4" Wil. & Morman drill 24" Ingersoll cutter grinder Hutto honing machine Nos. 50 & 60 Heald

Norton type 15 lapper No. 575 Hawes polisher 14" Pratt & Whitney surface 20"x12"x50" Safety Emery Wheel Co., surface Nos. 6 & 15A Bryant internals

500 lb. Bradley helve 600 lb. Chambersburg b. d. Nos. 1, 2M Pettingell bumping Pettingell double unit, No. 2M

LATHES, MTG.
No. 16 Gisholt Simplimatics
1"x18" Pratt & Whitney auto.
9"x14" Porter Cable
10"x18" Adams "Short Cut' 13x6' Automatic threading 20"x8' Wickes 12 speed geared head Rapid Production Melling camshaft 4 cyl. motor Melling crankshaft 6 cyl. mtr. No. 9 LeBlond Multi-cut

PRODUCTION & MISCELLANEOUS

No. 3C Lees Bradner thread Nos. 1 & 1A Davis & Thompson drum Nos. 10 & 45 Bilton Productomatic

Kempsmith, Fox Whitney, Superior hand mills 25"x25"x14' Ingersoll Slab No. 7 Becker Brainard No. 12 Brown & Sharpe

PLANERS 24"x24"x5" Gray 24"x24"x6" Woodward Powell

PUNCHES 34"x34" Rock River, 26" throat 114"x1" L. & A. 12" throat 114"x1" Cleveland horizontal No. 54 Hendley & Whittemore comb. punch & shear

ROLLS

No. 1A Ajax taper forging 54" McKay sheet leveler 4"x3/16" Bay City roll

SAWS, METAL 6"x6" Toledo hack saw. New 6"x6" Racine hack saw

or xor facine nack saw Grabo No. 2 metal saw table 4", No. 12B Higley cold saw 6", Nutter & Barnes-Green-field Cold Saw 7", No. 14 Higley Cold Saw 24" No. 17 Racine Abras. c.o.

SHAPERS

36" Morton draw cut, power rotary feed to head

SHEARS 18" Pels all steel beam shear No. 418 Toledo squaring No. 0-15 Stanley Unishear Newbold guillotine

Lewis Alligator No. 1 Hilles & Jones Alligator

SHEET METAL TOOLS 4'x1/4" Cincinnati press brake Nos. 1 & 2M Pettingell bumping hammers %"x3" Shuster wire straight-

ener & cutter %"x5' Shuster wire straight-

ener & cutter
No. 3 RH Magee wiring mch.
No. 1B Campbell Nibbler

SLOTTER 12" Dill

SWAGER

No. 6 Langelier with feeder THREADERS

1/2" Webster & Perks double 1/2" Acme double head 3/4" Economy 1/2" Geometric with 1" Mur Geometric with 1" Mur-

11/2 Geometric with I Murchey die head
1" 2" & 21/2" Landis single
2" Landis 2 spindle pipe &
nipple threader
2" 22/2" Landis 2 spindle

Rogaco pipe machine UPSETTERS

2½" & 4" Ajax 1½" Acme 2" National No. 1A Ajax forging rolls WELDERS

12 KVA Am. Elec. Fusion

12 KVA AM. Electronic spot
17 KVA Thompson Gib spot
20 KVA Agnew spot
20 KVA Taylor spot
20 KW Autional, 220 V.
20 KW Taylor Maestra port.
23 KVA Winfield
150 KVA A.E.F. projection, multiple spot

multiple spot
375 KVA Fisher, press type
25 KVA Fisher, press type
25 KW Winfield butt, 220 V.
36 KVA Thomps. butt, 220 V.
35 KW No. 60 Federal butt
65 KW Federal butt
150 KVA No. 35 Swift flash

Put your surplus machines to work! Please mail us your list.

"Keep'em flying"

MILES MACHINERY CO., SAGINAW, MICH.

VICTOR'S BARGAINS IN Tungsten Carbide Tipped Tools

Price \$1.00 Each In Any Size

New Low Prices. - Increase Production - Cut Operating Costs

Tools are tipped with Tungsten Carbide, and are suitable for machining cast-iron, brass, bronze, aluminum, non-ferrous materials (such as hard rubber, bakelite, fibre), and tough alloy steels up to 500 Brinell hardness.



Sizes not listed as well as special TIPPED TOOLS will be quoted upon request. When ordering, state tool number and quantity desired.

We Garry Silicon Carbide Emery Wheels for Grinding Tungsten Carbide Tool Bits

SEND FOR OUR CIRCULARS

Victor Machinery Exchange, Inc.

251 CENTRE STREET

NEW YORK, N. Y.

LONG LENGTH HIGH SPEED DRILLS

9" Cutting Flute 12" Long



Size	Length Overall	Length of Flute	Our Price
Inches	Inches	Inches	High Spee
3/16	12"	9"	\$3.00
7/32	12	9	3.25
15/64	12	9	3.25
1/4 17/64	12 12	9	3.50 3.50
9/32	12	9	3.50
19/64	12	9	3.50
5/16	12	9	3.75
21/64	12	9	3.75
11/32	12	9	3.75
23/64	12	9	3.75
3/8	12	9	4.00
25/64	12	9	4.00
13/32	12	9	4.25
27/64	12	9	4.25
7/16	12	9	4.50
29/64	12	9	4.75
15/32	12	9	4.75
31/64	12	9	5.00
1/2	12	9	5.00

SEND FOR OUR CIRCULARS

VICTOR MACHINERY EXCHANGE, INC.

251 Centre Street

New York, N. Y.

MAKE SAPS OF THE JAPS!

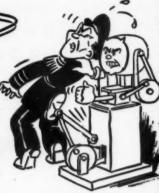
How would you like to see your punch press take a punch at a Jap?

You can do it—and with all the gusto and glee of a fellow who has just won the DONBERG and DANITS Daily Double.

You see our plan enables you to win two ways. We will buy your idle or obsolete machine tools. THAT gives you a profit. Then we supply the machine tools to those who need them in turning out the weapons of war—think of the pleasure and profit you will derive from knowing that your entwhile idle machinery is making armaments to help beat our enemies.

Send us a list of your idle tools today.







"MACHINES HARD TO FIND"

4 Spdle. Henry & Wright Hand Feed H.S. Drill

2-spdl. Demco H.S. Sensitive Drill, floor type

Rockford Single End Hydraulic Boring Unit with 2-sta. 54" dia. table No. 60 NATCO 3-way Mult. Spdl. Drilling Mach., m.d.

6' Prentice Radial, cone drive

6' Niles Plain Radial Drill

Gisholt Universal Tool Grinder

Slotting Attach. for No. 1 B. & S. Miller

2-%" Shuster Auto. Wire Straighteners

1/2" Shuster Auto. Wire Straightener

10" Napier Metal Band Saw

Your inquiries will be appreciated.

Strong, Carlisle & Hammond Company

1392 West Third Street, CLEVELAND, OHIO Branch 2832 East Grand Blvd. Office: DETROIT, MICHIGAN.

EPENDABLE MACHINERY * * FALK-

GRINDERS Cylindrical

:0"x120" LANDIS Self-Cont.,
- Motor drive
2x36" CIN. Pl., Arr. Motor dr.

Cincinnati Surface Broach No. 5-54" Duplex with Swivel Table, new in 1937

DISC GRINDERS

Fardner No. 8—40" disc, 30"
Ring Wheel, B.B. Belt dr.
Ardner No. 4—20" Disc, 16"
Ring Wheel, B.B. Belt dr.
Sadger No. 2—16" Disc, Dble
End, Univ. Tables, Belt
ardner No. 1—dbl. end Disc, Ring Sadger No. 2—able, Beat, Univ. Tables, Beat, Univ. Tables, Beat, End, Univ. Tables, Beat, End, Univ. Tables, Beat, Ball Beat, Ball Beat, Coulombie opposed, 20" discs

SLOTTERS

Smith & Mills Helical Grd. HENDEY ,Frict. Dr. (5), #HENDEY Friet. Dr. 4450 each

1450 each

15" CIN. Geared, Crank, Saper

10" Steptoe B.G. Crank Shaper

10" Steptoe B.G. Crank Shaper

10" Steptoe B.G. Crank Shaper

2" New Haven Slotter; 32"

"Motary Table

State Table

State Table

State Table

State Table

State Table

16" Davis Back Geared, Crank

Shaper, Single Pulley Drivo

thru Quick Change Gear Box,

Arranged for Geared Mr. Dr.

4 ATHES

LATHES 2"x25' PUTNAM trp. grd., 17'

2° x25' PUTNAM trp. grd., 14' 6" ctrs.; pl. che. gr., ser. cut. 6" x16' GREAVES-KLUSMAN, Pl. chg. gr.; Scr. Cut. 20" Ch. 22"x16' REED light Pattern, Pl. Chge. gear; 11" Centern, \$750 8x8 Lodge & Shipley Q.C.G. Late type 6x6 American, DBG. C. C. 6x6 American Q. C. G. Taper,

M.D. 4"x6' MONARCH cone dr. qk.

+

.

.

A

"M.O. MONARCH cone dr. gk.
"Name: Draw in bar & Colteta. Chuck, etc.
"Ax8 Rockford, Q.C.G. Cone
"X44" DAVIS pl. change ser.
cut. eng. lathe; compl. \$225
"X4" LOGAN (NEW) Lathes;
B. Brg. Spdl.; "Collet cap;
arr. for motor dr.; pwr. cross
sfeed; \$225 f.o.b. factory; priority certificate required; ship"MONE" PECUSION BENGH
"LATHES—Hardinge, Sloan &
Chase and others
"X108" FITCHBURG LOSWING LATHE. SPD.
SWING LATHE. SPD.
S"x12" HAMILTON pl. change,
cone dr. chuck

8"x12" HAMILTON pl. change, come dr. chu'sk 1"x4" P. & W. TOOLMAKERS LATHE, Taper att.

16"x6' SOUTH BEND pl. chge., 15 lb. Bradley upright Strap Screw Cut. Eng. Lathes (2) Hammer MILLING

MACHINES

Index No. 40H Universal Vert.
Milber
CLEVELAND VERT. MILLERS
No. 1, new

SUDDEN DELIVERIES

No. 12 Pratt & Whitney Lincoln Mill No. 2 Pratt & Whitney Lincoln Production Mill No. 12 P. & W. DUPLEX PRO-DUCTION MILL.

100 ton Ferracute No. FRG-103 Double Crank, Back Geared Press. 4" stroke 10" die height, belt drive. Weight 16,000 lb.

TURRET LATHES

3x36 J. & L., Double Spindle, fine cond. Cleveland Model A, 2" agl. spdl. Gridley Model G, 9/16" 4-spdl. RADIAL DRILLS

DRESES 4' Arm, Pl. Rad., c.dr.

DIE CASTING MACHINES 3-MADISON - KIPP late mod., 10"x12", 12"x14", 12"x18"

PUNCH PRESSES

No. 41 TOLEDO HORN PRESS arr, Motor dr. 25 Ton Henry & Wright Hi-Sp. Press, dble roll feeds No. 1038 BLISS GANG DIE PRESS; Roll feed No. 44 BLISS three col. Forging Press with Taper Rolls G Ton General Flexible Press 12 Ton Fox Flexible Press 2000 lb. Massillon Steam drop Hanner

Hammor 400 lb. Miner & Peck Belt drop, with Lifter 200 lb. Bliss Board drop ham. 0 lb. DuPont Blacksmith

Hammer

Hammer
No. 30 BLISS ARCH PRESS,
Plain
No. 25 NIAG. ARCH PRESS,
Plain
No. 71 Waterbury Coin. Press

25 tons 0. 93D TOLEDO DBL. CRK. GRD. S.S. PRESS, Welded No.

GRD. S.S. PRESS, Welded Frame
No. 75 Toledo Open Back Plain
Flywheel Press
No. 16 Bliss Horn Press, 3"
stroke, Motor Driven
No. 2 Niag. OBI; No. 0 V&O(3)
No. 3 American Can Co. OBI,
No. 53 Perkins Sprue Cutter
No. 2 Middledlitch Sprue Cutter
No. 1—100 lb. Standard Auto.
Draw. Hammer

No. 1—100 lb. Standard Aut Drop Hammer No. 702—BLH8S TRIMMING PRESSES (2) Flat No. 4 Waterbury open back, rigid bed, plain 520 no. Southwark Hydraulle 520 no. Southwark Hydraulle SHERIDAN EMBOSSING PRESS, 24x36

AUTOMATIC CHUCKING MACHINES

No. 24 New Brit. 5 spindle
No. 23 New Brit. 5 spindle
J&L HARTNESS AUTO.
CHK. LATHE; m.d. 6"x12"

GEAR CUTTERS

No. 2 WHITON SPUR GEAR CUTTER. Auto. 36" Gould & Eberhart, "Victoria Model" perfect Cond. 48" Gould & Eberhart, Mtr. Dr.; Complete; Perfect Cond. No. 36B Gould & Eberhart, Spur and Bevel Gear Cut., Mtr. Dr.

HAMMOND 10 H.P. BUFF-ERS-8 months old Mtrs. in base, 3-60-220/440

PIPE MACHINES

18" Saunders Motor Driven 12" Merrill Motor Driven 6" Williams Motor Driven 4" Curtis Portable, M.D. 2" Landis Belt Driven—fin

PROFILERS

No. 3 Garvin Sgl., Spdl. B. Dr. COILING

MACHINES

No. 1 and No. 2 SLEEPER & HARTLEY BX CABLE COLLING MACHINES and 4" cap. Last used for Speedometer cable. Complete

KEYSEATER

3 BAKER 72"x3" Cap., immediate delivery

FALK MACHINERY COMPANY 15 WARD STREET ROLL ROCHESTER, N.Y.

IF WHAT YOU WANT ISN'T HERE

BRAKES

8'—18 ga, Chicago Stael, New and used 8'—16 ga. Chicago steel

DRILLS:

Radial, Sens. 3 ft. American Prentice, 4-spdl, high-speed Allen 3-spdl, BB, cap, 1" Dwight-Slate 7-spdl, 14" U. S. 385.00 20" Sibley & Ware B.G., P.F. 20" Bliwattee B.G., LF.

FORGING MACHINES: Two 24" Aiax: estd. wt. 47,000

Two 2½" Ajax; estd. wt. 47,000 lba. each

GRINDERS:

Angle Plate, Clark & Cincinnati Disc, No. 6-20 Bealy Dhl. Spdl. Flex. shaft, RA 5 Haskins Flex. shaft, RA 5 Haskins Flex. shaft, Sloux No. 1120 Entern. Black & Docker, on Emerg. DE, Norton 24" Emerg. DE, Norton 24" Emerg. DE St. Louis 18" & 20" Wet tool, Springfield, 27" wheel

LATHES:

14"x6' Rumsey, PCG 10"x42" & 10"x48" Atlas, bench type and motors

PRESSES:

Arbor, Famco and Atlas.
Arch, Bliss 80-A Grd., M.D.
Foot, Famco and No. 4 Swaine
O.B.I., No. 3A Willard
O.B.I., No. 19 Bliss
Btiles Grd.
Punch, No. 5 Bliss Stiles Grd.

PUNCHES A SHEARS:

Bock River L, 24" thr. 1 in 1" DE 1-10 Badger 1 in 1", 10" thr. No. 4 L & A, Multiple, 30" betw. housings, 6" cap.

SAWS:

Hack, No. 14 Atkins 6x6" Wells No. 5 & 8, Band, Metal new

SHAPERS:

26" Hendy planer type dr. 7" No. 7B Atlas

SHEARS:

Dbl. action, No. 11 Excelsior, inside cutting, cap. 12 ga.

Send Us Your Inquiry

Rotary Bevel, Lennox 4" Slitting, Rotary Cap. 18 ga. Throat 60" Square, 36"x18 ga. Pexto Poot, New (3)

New (3)
Square, 30"x18 ga. Ditto
Throatiem, 18 H MarshalltowwyTHREADERS, Pipe & Boit:
No. 402 Oster Power Boy, 2"

No. 402 Outer Power Boy, 2" cap.
Roller Cut-off, No. 1 Oster, 2" h

MISCELLANEOUS:
Blowers, No. 1, 2, 3, 4 Champion Chucks, 12", 14", 18" L-W 4-jaw Compressors, Ingersoll-Band 2½x

compressors, Ingersoll-Band 2½x 3°: Hobart 2 x 2½°: Quincy 2½x2½°; All with tanks and motors Gear Cutter, No. 4 B. & B. Hammer, riveting, No. 5A High-Speed

Speed Hammer, trip, Modern Hammer, trip, Modern Jacks, Lever Lift, 15 ton Joyce Gridland; Simplex; 10-ton Barrett Lockformer, Cap. 24 ga., & mtz. Miller, bench, MF-G Atlas Roll, Corrugatins, 10-Robinson Tapper, No. 8 K, Louis Valve Refacer, 4 Black & Docker Weldern 24, 5, 74, 10 K W

Brown Mchy. Co., 2333 N. Ninth St., St. Louis, Mo.

FINE GOOD TOOLS!

AUTOMATICS, (2), %" Cleveland Model B, 5 hole auxiliary turret, 20,000 serial \$1250.00

AUTOMATICS, (2), No. 52 Acmes, M.D. \$1750.00

AUTOMATIC, No. 54 Acme, M.D. \$3750.00
AUTOMATIC, 21/4" Cleveland Model A
\$2500.00

AUTOMATIC Chucker, size 24 Prentice\$675.00

BORING MILL, 36" Bausch, 2 hds., M.D.
REBUILT\$3750.00

DRILL PRESS, 20" Rockford, P.F. ..\$150.00

DRILL PRESS. 3 spindle Barnes, Production, No. 3 taper, P.F. \$1000.00 DRILL PRESS, 4 spindle Barnes, Production, No. 3 taper, P.F. \$1250.00

HACKSAW, 6x6 Racine high speed \$135.00 LATHE, Fay Automatic, 12"x15" ..\$1500.00 LATHE, 22"x14' Niles\$850.00

LATHE, 22"x12' Lodge & Shipley, Q.C.G., taper attach., D.B.G.\$1750.00 MILL. Gooley Edlund Production, 48" table

\$875.00
MILL, Vertical, No. 1 Becker\$475.00
SHAPER, 16" Smith & Mills\$750.00

Malco Machinery Co., 1048 W. Van Buren St., Chicago, Ill.

Back Geared

REBUILT MACHINE TOOLS AVAILABLE FOR SHIPMENT

MILLING MACHINES

No. 1 Garvin. Universal

No. 1 Becker plain

No. 4 & No. 6 Beckers, vertical

No. 8 Pratt & Whitney Automatics, 5"x16"

LATRES

14"x6' Lodge & Shipley, qk. chg, mot. dr. 18"x8' LeBlond, quick change

20"x10" Monarch. qk. chg., taper attach. 20"x10 Rahn Larmon, grd. hd., quick chg.

20"x10 Lodge & Shipley, motorized 24"x10' Bridgeford, quick change gear, taper att.

38"x16' Bridgeford, taper att.

TURRET LATHES

l" Hercules, bar feed

2" Acme, bar and power feeds

No. 8 Bardons & Oliver, 21/4" bar feed, power feed

21" Gisholt, 31/4" spindle cap., 2 power feeds

24" Gisholt, 31/2" spindle cap., 2 power feeds, taper attach.

SHAPERS & PLANERS

16" Ohio Shaper

20" Stockbridge, motorized

24"x24"x6' New Haven Planer, I head 36"x36"x10' Gray Planer, 2 swiveling

heads, mot, dr.

42"x42"x12' New Haven Planer, 3 swiveling heads

GRINDERS

No. 1 LeBlond, tool & cutter 6x32" Norton, direct motor drive

10"x20" Landis Cylindrical, motorized 10"x24" Landis, self-contained, motor dr.

16x50" Norton, direct motor drive

New \$x18" Surface Grinders, motor in base

GEAR MACHINERY

3x36" Brown & Sharpe 25" Fellows Shaper

RADIAL DRILLS 21/2' Mueller, motorized

5' Cincinnati, motorized

5' Davis, motorized

PRESSES & BROACHING MACHINES

No. 3 Ferracute, 2" stroke

No. 24 Toledo, 5" stroke No. 3 LaPointe Broaching

MISCELLANEOUS

No. 16 Pels Univ. Punch & Shear, %"

plates, 4x4x1/2", angles, etc.

Hilles & Jones, 1" cap., 36" gap Shear &

Single Frame Hammer, 220 lbs. cap., m.d. Sandbl. Cabinet, 36"x48"

Graham Machine Tool, Inc. 231 CENTRE STREET.

TEL. Worth 4-8125-6

BLOWERS - FANS - EXHAUSTERS



Prompt Shipment

LARGEST STOCK IN THE U.S.A. Send Us Your Inquiries

Largest and most selective variety of makes, sizes, and types for all requirements for moving sit

Our Engineers will be glad to help you, upon request, without obligation.

Write for Our Latest Stock List

General Blower Co., Phone MONFOR 0244 Chicago, III.

FOR SALE

Automatics: No. 53 Acme, 4-spdl., 1" cap.
No. 52 Acme, 4-spindle, 4" capacity
No. 55 Acme, 4-spindle, 4" capacity
14" Cleveland, Model B
14" Cleveland, Model B
18" Cleveland, Model B
3" Cleveland, Model B
3" Cleveland, Model B
Turest Lathes: 3±336" Acme, grd.-hd., sp. 100 cm. 1 cm.

pulley dr., cross-sliding Turret, bar feed with erdlets Steinle, grd.-hd., V-belt dr., 64" hole in spindle

Garvin

in spindle

1" Garvin

No. 3 Bardons & Oliver, bar feed, power

feed to turret, 14" capacity (2)

Millers: No. 5 Blake & Johnson Vertical

No. 7 Becker Lincoln Type

No. 3 Garvin Duplex

Frost Hand

Muna

Muna

Muna

Muna

Muna

Frost

Filter

Frost Hand

Frost

Fr

Allied Machinery Company 14 North Clinton St., Chicago

63/4" Cleveland Model A Automatic 31/4" Gridley S.S. Automatic (2) No. 52 Nat'l Acme Automatic (2) 5/8" Cleveland Model B Automatic %" Cleveland Model A Auto., M.D. No. 12 Barber C. Gear Hobber, SPD. 6" Horizontal Cyl, Boring Machine 30" Bausch Vertical Boring Mill Gooley & Edl. Model B Briggs Mill 10"x36" Landis Pl. Cylindrical Grdr. 3"x36" J. & L. Flat Turret Lathe 84" Bradley Vert. Boring Mill, 1 Hd. No. 24—53" Gardner Disc Grdr., MD. No. 1 Barrett Boring Mill, 3%" Bar 3" Bement Dougherty Hor. Bor. Mill 8" Gleason Bevel Gr. Generator (2) 3" Horiz. Boring & Milling Machine 12" P & W Vert. Surface Grinder No. 6 W. & S. Turret Lathes (2) No. 56 Nat'l Acme Automatics 21/4" cap. (2) No. 53 Nat'l Acmes—(2)

20" G & E Shaper



BARRON MACHINERY COMPANY 627 W. WASHINGTON ST. CHICAGO, ILLINOIS

IMMEDIATE DELIVERY

6'x6' RACINE HACK SAW, M. D. 2- G. E. CENTRIFUGAL COMPRESSORS 36'x36'x8' POWELL PLANER-B. D. 16' PUTNAM SLOTTER, M. D.

1500 Ib. CHAMBERSBURG SINGLE FRAME STEAM HAMMER BRIDGEFORD CENT. DR. AXLE LATHE (will take 12'x8' Axles)

KAMIS ENGINEERING CO. PHILADELPHIA, PA.

302 MOORE ST. HOWARD 8474

MILLING MACHINES

No. 3 Davis Thompson Rotary; M.D. No. 10 Bement Vertical; 66" retary table; M.D.

HYDRAULIO PRESS

1500-ton Hydraulic Press Mfg. Co.; stroke 12"; bolster plate 48"x48"; motor drive GEAR CUTTERS

60"x12" Gould & Eberhardt

TURRET LATHE 21" Gisholt; 34" hole; Taper Attach.; M.D.

SUN MACHINERY COMPANY.

RADIAL DRILL & DRILL PRESSES

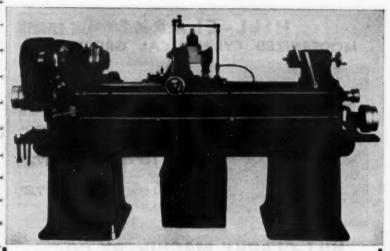
7-ft. Bausch Plain Radial Drill; M.D. 8-ft. American Sensitive Radial Drill; M.D. 6-spindle National Acme Horizontal Drill

MISCELLANEOUS

PIPE MACHINES, 10" Saunders; 2" Jarecki PLANER, 24"x24"x25' Chandler RIVETER Hydraulic, 150-ton Chambersburg 6" stroke; depth of gap 150" SHEAR, No. 2 Lemnox Bevel; 2" capacity SHEAR, H. & J. Throatless Geared Slitting

36 VAN VECHTEN STREET, NEWARK, N. J.

S



6' x 48' PRATT & WHITNEY THREAD MILL

ALSO AVAILABLE



2%' Model G Gridley Automatic Bar Machine

LAKE MACHINERY CO.

632 W. LAKE ST.,

CHICAGO, ILL.

Send for our Bargain Circular covering Machine Shop Small Tools such as Taps - Drills - Reamers - Vises - Turret Attachments, etc.

DE WITT TOOL COMPANY

HILL-CLARKE MODERNIZED CYLINDRICAL GRINDERS



SIZES

10'x18' 14'x36'

10'x36' 14'x50'

10'x50' 14'x72'

10'x72' 16'x72'

18'-30'x96'

ARKE MACHINERY CO.



PRATT & WHITNEY AUTOMATIC WORM GRINDER M1554-121

MISCELLANEOUS Automatics, 2½" Gridley, 4 spin-die, Model F

A B C tomaking Machine, New Britain No. 484 (2) ar Shapers, Fellows Automatic No. 6 (8) Ill. Camel Back, 2 Spindle, Large Base

Bryant No. 10A

2 Brown & Sharps

ler, Surface, No. 14 Pratt & litney, with magnetic chuck ers, Barber C. sgl. overarm . 12 m.d. (2)

n.d. (2) Automatic, LeBlond

SIEGMAN MACHINERY

561 W. WASHINGTON BLVD.

CHICAGO, ILL

REBUILT MACHINE TOOLS — — and we DO mean R-E-B-U-I-L-T

TURRET LATHES

- 1—21" Gishoit saddle type turret lathe, cone drive, back geared, with 3 jaw steel body universal chuck, with taper attachment, with power rapid traverse, hole through spindle 3½"
 4—2x28", Jones & Lampon turret lathes, all geared head, s.p.d. cross silding headstock
- 2-3x36" Jones & Lamson Turret Lathes; all geared head; single pulley drive; cross sliding headstock. Arranged for chucking work

CHUCKING MACHINES

- 2-No. BA Potter & Johnston turning and chucking machines, swing over bed 17"
- 1-No. 22 Prentice (New Britain) multiple spindle automatic chucking machine, belt drive with
- four spindles and five chucking positions
 1—No. 24 Prentice (New Britain) nultiple spindle automatic chucking machine, belt drive, with four spindles and five chucking positions

LATHER

- 1—8x80" Lo Swing lathe, all geared head, single pulley drive with one tool post carriage
 1—20"/44"x8' Putnam Gap Bed lathe, cone drive, back geared
 1—16"x8' Monarch engine lathe, double back geared machine, change gears

GRINDING MACHINES

- 1-12"x80" Modern Self Contained Plain Cylindrical Grinder; all power feeds. With swivelling
- table for grinding tapers

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical

 1—No. 14 Brown & Sharpe Plain Cylindrical Grinder; three-motor-drive including electrical grinders. equipment. This machine is also arranged for plunge cut grinding. Maximum swing 10"; maximum grinding length 30"

RADIAL DRILLS

- 1-3 ft. Dress radial drill, cone drive, can be arranged for motor drive 1-4 ft. Prentice plain radial drill, direct motor drive through gear box with geared feeds and speeds

MISCELLANEOUS

- 1—No. 3 Thiel Combined Filing and Sawing Machine
 1—Model C-13-O Natco Multiple Sprindle Drill Press; motor drive through gear box. Power feeds; arranged for 14 spindles, equipped with 8 spindles



YOUR DEPENDABLE MACHINERY DEALERS

LAURENS BROS.

70th & LONGVIEW STS., Tel.: VAlley 7200

CINCINNATI, OHIO

144 INCH GLEASON STRAIGHT REVEL

GEAR PLANE

CAPACITY: Spur Gears to 144' Dia. x 16' Face, Bevel Gears to 100' Dia. x 16' Face, Internal Gears to 96' Dia. x 16' Face. Motor Driven with 220 Volt, D. C., 1000 to 1800 R.P. M. Motor. With Standard Equipment and Large Assortment of Cutting Tools.

INDIANAPOLIS MACHINERY & SUPPLY CO., INC. 1959-69 S. Meridian St., Indianapolis, Indiana

MILLING MACHINES

No. 30 Sundstrand Rigidmill M.D. 2" Pratt & Whitney spline (duplex) No. 2 Knight Vertical (2)

GEAR MACHINERS

No. 61 Fellows Gear Shaper M.D. 9" Pratt & Whitney Gear Grinder No. 4-48" Brown & Sharpe Gear Cutter Lees Bradner Gear Grinder (2)

No. 303 Bliss St. Side, M.D. No. 225 Adriance, Solid back No. 50 Mossberg & Granville

DRILLS

3' Morris M.D. 4 Spindle Henry & Wright B-16 Natco—M.D. 4 Spindle Taylor & Fenn M.D. (2)

6"x64" Goss & DeLeeuw Model & Chucking 24x24 Jones & Lamson M.D.

8" Bullard Multomatic M.D.
No. 29 Heald Rotary Grinder M.D.
24x24x8' Whitcomb Planer
1,5" Acme Bolt Threader M.D.
No. 1 Foote Burt Duplex Surface Broach
No. 4 Hilles & Jones Dbl. End Punch & Shear
No. 20 Waterbury Farrei Thread Roller

WIGGLESWORTH MACHINERY COMPANY

201 Bent St., Cambridge, Mass.

Over 35,000 circulation this issue.

Is your ad among its pages?

FOR IMMEDIATE DELIVERY



MANVILLE AUTOMATIC WOOD SCREW POINTING & THREADING MACHINES

50-No 2 for woodscrews No. 8 to No. 20-length from 3/4" to 31/2". 12-No. 3 for woodscrews No. 12 to No. 30-length from 3/4 to 61.

VERY GOOD CONDITION. LOW PRICES. For details write or wire

H. H. PELZ MACHINERY CO., 9 So. Clinton St., Chicago, Ill.

SCREW MACHINES

44" Gridley Model F 4 Sp. 11/4" Gridley Model F 4 Sp. 2" Cleveland Sgl. Spdl., Motor Drive

PUNCH PRESSES

No. PG2 Ferracute & Nos. 4 & 94 Bliss Stiles type No. 2 & 3 Verson O.B.I. 2" No. 4 Verson O.B.I. 3" Str. 15x8 Carroll-Jamieson QCG.
No. 6 Rockford, 5" stroke, 16x8 Filsmith Q.C.G.

straight side press, bolster 2"x27x20 GRINDERS

Tool & Cutter, all sizes
18" to 30" Disc, with tables
53" Gardner Horiz. Disc
No. 3 Barber-Coleman Hob. HOBBERS & GENER'S.

5", 11", & 18" Gleason gr.

LATHES

MISCELLANEOUS

Bolt Threader: 2" cap. Lan-dis, 1½" Landis, Dbl. Hd. Boring Mill: 2½" Barnes dis, 1½" Landis, Dbl. Hd.
Boring Mill: 2½" Barnes
Broaches: V-18 American,
Drills: 20" to 30" All makes
Millers: No. 33 Kempsmith
Prod. with Grinding Head
No. ½ VanNorman Plain
Miller, Aux Head

Miller, Aux. Head Presses: 1D Bliss D.C. 17"x17" Knuckle Joint Planer: 24x24x6 Gray

PARTIAL LIST. SEND US YOUR INQUIRIES.

Segal Machinery Co., 117 S. Clinton St., Chicago, Ill.

YOUR REQUIREMENTS ARE OUR BUSINESS

SPECIAL COLLECTION OF GRINDERS Greenfield Hydrole Internal 12"x36" Pratt & Whitney Vert. Surf. 8"x15" Fitchburg Ext. No. 3 B & S Univ. No. 2 Morse Univ. Gardner Buffing Stand

No. 24 Landis Ext.; 16"x72" Garvin Int. 4"x14" Gardner Semi Auto. Disc, 18" sgl.

end, M.D. No. 8 Badger 26" dbl. end, M.D.

No. 28-1A Hydroil Int. PLANERS

36"x30"x9' Hamilton, 2 hds. 42"x42"x10' Ohio, 1 hd. 30"x30"x8' Gray

Devlieg 16"x72" M.D. No. 2 Craftsman Rotary Cont.

NOTICE THIS LATHE 20"x18' Houston Stanwood & Gamble Geared Head. REBUILT AND

GUARANTEED 17" LeBlond Hi-Duty Production SPECIAL LOT OF MACHINES

V 18 American Mechanical Broach Kent 1/2" Stud Threader

Webster & Perks 5 Spdl. Tapper

12 Roll Continuous Rolling Mach. for Metal Lath Partitions

Sheet Metal Bumping Hammers Quickwork & Pettingell

11/2" Landis Double Head Bolt Thrd. ACME ALL STEEL HOT UPSET-TER 2"

SHEARS Niagara Square 12 ga. 144" Niagara Square 14 ga. 120"

MESTA GATE SHEAR CAPABLE OF HANDLING 41/2" x41/2" billets or 7/16"x40" sheets. Write for full details

No. 2 Ryerson Lennox Throatless Bevel Shear No. 14 Pettingell Rotary Shear PRESSES

No. 16 Niagara Horning No. 8H Cleveland Horning

ITEMS ON THIS LIST ARE IN OUR WAREHOUSE AND OWNED BY US. NO RED TAPE. IMME-DIATE DELIVERY.



Write-Wire-Phone Fitzroy 7745

LAFAYETTE MACHINERY CORPORATION

6320 E. Lafayette,

Detroit, Mich.

LARGE STOCK of MACHINE TOOLS

We Specialize In

Automatics, Production Type Drill Presses. Lathes, Punch Presses, etc.

SEND US YOUR INQUIRIES.

Advise us of any machine tools you have for sale.

International Mchy. Co., 3133 E. Jefferson,

Detroit

42°x14' RAHN-LARMON LATHE, SCO. with Turret Attachment & Equipment.

18"x14" Hendey Lathe, Q. C. G.

21/21 Dreses Radial Drill.

38"x30"x8' CINCINNATI and POND Planers.

11/4" and 2" O B | Power Presses.

Newton Vertical & Horizontal Miller,

Also Turret Lathes, Millers, Shapers, Planers, Radials, for Immediate Delivery

ATLANTIC

MACHINERY EXCHANGE

NEW YORK, N. Y. 212 CENTRE ST.

36"x36"x10' Niles Bement Pond Planer 2 Side Heads Box Table

20" Gisholt Turret Lathe-61/4" Hole in Spindle

4' Niles Bement Pond Pl. Radial Drill

36"x16' Lodge & Davis Engine Lathe

42"x12' Gleason Engine Lathe

12"x36" Modern Plain Cyl. Grinder

1/2" Cleveland 5 Spdl. Auto. Screw Machine

Gray Nibbler, 36" cap., 36" throat 56" Natl. Acme 4 Spdle. Automatics



achinery Lompany 41 So Clinton St

NEW 3 Phase B. B. Motors ½ to 25 H. P.

DRILLS
20° Lever, Wheel & Lever and Power Feed.
24° and 20° sliding head, back gear, power feed.
17° and 14° Delta, new.
Ceiling suspended, drilling area unlimited.
5° Bauuch Radial Drill.
3° Bauuch Radial Drill.
3° Bounch Talls of various sizes and types.
LATHES
6° and 10° ATLAS new.

6° and 10° ATLAS new.
10° Clausing new.
18° Zô' Champion, quick change gears.
18° Zî' Champion, quick change gear, two chuck,
12° Zô' Sencea Falls, floor type.

This is only a partial list of our large stock, which is constantly changing. Write for what you need. THE OSBORNE & SEXTON MCHY. CO., Dept. H. COLUMBUS, OHIO

Lathe, 28'x20', 6' Rahn Carpenter, with rais. blocks.
MISCELLANEOUS

MISCELLANEOUS
Brake, Robinson, toggls, 5¹.
Grindera, Bryant deep hole chucking.
Broaching Machines, No. 1 and No. 3 LaPointe.
Kempsmith No. 2 universal attachment, new.
Milling Machine, 20³ x20° x8² Ingersoll Slab, m. d.
Punch & Shears, several, different sizes.
Shaper, 14° Niles draw cut.
Shaper, 16° Hendey genred.
Shaper, 24° G & E, back geared crank.
Spencef turb. comppr., 150 CFM, 16 oz. pressure.
MOTORS, REBUILT 3 Phase ½ to 50 HP various speeds.

DRILL PRESS

Natco Multiple Spindle Drill Press Series C-10. Rectangular Head 24" by 38" over all, Table 23" by 25". Hydraulic Feed to Table. Head stationary 16 Spindles No. 1 Morse Taper, 3 Phase 440 Volt Motor Drive VERTICAL MILLING MACHINE Brown & Sharpe No. 2 no power feeds arranged for Jig Boring with Vernier Readings Both Directions, Motor Drive 220 volt, 3 Phase 80 Cycle SCREW CUTTING LATHE

Fifield 32"x18" Internal Face Plate Drive. Loose Change Gear POWER PRESSES

Bliss Punch Presses (Styles Pattern). No. 2-3 & 4 Motor Drive 220 Volt 3 Phase 60 Cycle

MORRIS MACHINERY

93-105 CHESTNUT ST.,

NEWARK, N. J.

GRINDERS

Cincinnati No. 2 Univ. (12"38") Cyl.
Black 6 Decker 5 H.P. Hv. Duty 48" Between 14"21½" Wheels
HEALD No. 72A-7 INTERNAL, MOTOR DR.
Heald No. 80 Internal (8)
Heald No. 60 Internal
PRATT 6 WHITNEY 12"x38" VERTICAL
SURFACE, MAGNETIC CHUCK

LATHES

14"x8" Sebastian, All Geared Hd. 16"x8" Lodge & Shipley (Patent Head) Q.C. 18"x8" Sidney Q.C. (Hv. Duty—Double

Back Grd.)
Sidney 18"x8" Q.C.
18"x8" Mueller Q.C. Double Back Geared
18"x8 Chard Semi—Q.C. Double Back Gegred

Rivett 608, Completely Equipped (Precision Bench Type)

MILLS

Becker No. 3 Vertical Taylor & Fenn Vertical, 8" Overhang S.P.D.

TURRET LATHES

Giabolt 14" & 24"
WARNER & SWASEY (NO. 2 SPECIAL) 214"
CAP. AUTO. CHUCE, PWR. FD. TO TUR.
GISHOLT 21" GEAR BOX MOTOR DRIVE
(COMPLETE) LATER TYPE 2 STEP CONE
MACHINE

DRILLS

41/2' Pond Radial ALLEN 4 SPINDLE No. 2 M.T. POWER FD. ALL SPDLS.

AUTOMATIC SCREW MACHINES

ACME NO. 52 34" 4 SPDL. (REBUILT) M.D. (1)

GRIDLEY 4 SPDL., 1%" MOD. F (2) MD. GRIDLEY 4 SPDL., 34" MOD. F MOTOR DRIVEN, COMPLETELY EQUIPPED

CLEVELAND MOD. M. 4 SPDL. 1-1/16" CAP. STANDARD MOTOR DRIVEN MACHINE

CLEVELAND: %", %", 114" MOD. B., ALL DOUBLE SLIDE. ALSO 11/4", 18" FEED, SHAFT MACHINE

L & G 2 spdl., pwr. feed, No. 2 M.T. 32" Snyder Geared Dr., No. 5 M.T.

MISCELLANEOUS

Bradley Compact Hammer, 125 lb.
NO. 2 DAVIS KEYSEATER
Waterbury F. Arch Press, Geared 8" strk.
DO-ALL SAW MOD. C.S. 12" THROAT, 4"
CAP IN STEEL Klemm No. 2 Cut-Off Saw Reynolds Auto. Screw Driver Peerless Hack Saw—6"x8" b Schuster Wire Straightener : 2/16" Cap. Hack Saw—6"x6" M.D. Wire Straightener 3 Ft. Length.

MACHINERY SALES

Your Inquiry Will Bring a Complete and Accurate Description of the Machine-All Machines Guaranteed to be Exactly as Represented

> Now Located In Our New Plant 4300 N. California Av. All Phones JUNiper 3363

BOLT CUTTER, 1" & 14" ACME dbl. spdl. BORING MILL, 48" Bickford, b.d., 2 beads DRILL, 24" Foote Burt heavy duty SP dr. DRILL, 24" Snyder, aliding bead, tap. at-tach. belt

DRILL, 2 spdl. Foedick, B.B. No. 2 M.T. GRINDER, 20°x144" Landis, plain cylindrical GRINDER, 12"x36" Pratt & Whitney Verti-cal Surface with magnetic chuck

*GRINDER, No. 1 Gardner, face, table 10"x 30", cup wheel 20" GRINDER, No. 6 Bryant inter. chkg., m.dr. *LATHE, 20"214' Springfield, grd. hd. 8.P.

LATHE. 21"x8' LeBlond, mtzd., q.c. LATHE. 22"x10' LeBlond, prod. type, belt LATHE. 24"-48". 112' McCabe. 2 apdl. belt LATHE. 24"-48". 112' McCabe. 2 apdl. belt LATHE. 26".50"x18' McCabe 2 apindle, belt MILLER, No. 8 Becker Duplex, table 40x1. MILLER, No. 1 Standard, hand, motor, vertical and slotting. PIPE MACHINE. 4".2" Landia, belt drive PIPE MACHINE. 4".8" Williams, motor dr. PLANER. 24"x24"x8' Wheeler, b. dr., 1 hd. SHAPER. 16" Smith & Mills, bg., belt drive TURRET. 24x26" Greenlee, mtzd. bar equip. TURRET. 3"x36" Jones & Lamson, grd. TURRET, 24" Gisholt, mtr. dr., 2½" bollow apdl. andl

THE O'BRIEN MACHINERY CO., 113 N. Third St., PHILADELPHIA, PA.

FOR SALE

- No. 1 Williams-White Bulldozer. 14" stroke
- 1-24" Gleason Bevel Gear Planer
- 1-24" Newton Combination Cold
- 2-10' Ohl Press Brakes, 10 ga.
- 1-No. 8 Whiting Single End Punch.
- 2-Bedford 42"x42"x13' Open Side Stone Planer
- 1-36"x36"x13' New Albany Stone Planer
- 1-48"x42"x15' Patch Stone Planer
- 1-10-Ton Stiff Leg Derrick, 70' steel boom, 40' steel mast
- 1-21/2-ton Northern Electric Crane. floor operated. 21' span

E55LEY MACHINERY CO 831 W. EVERGREEN AVE - CHICAGO ILL

Invest

OTT MACHINERY SPECIALS

AUTOMATICS

Brown & Sharpe, No. 80 Cut-off Cleveland, Model A, 1¼ & 2 New Britain, No. 22, 23 and 24 Automatic Threading Lathes, 13"x6" G.H. Gridley, 2¼, 3¼ & 4½" S.S. Potter & Johnston No. 5A & &A

DRILLS

Baush & Natco Multiple spindles Henry & Wright, 1 to 8 Spdl., No. 2 mt.

GEAR SHAPERS

Fellows 36"

GEAR HOBBERS

Barber-Colman No. 3 & 12

GRINDERS

Heald No. 65 Cylinder Landis, 10x36 Hydraulic, M.D. Norton, No. B81—14x36" Crankshaft

LAPPERS 7 26" Bethel Player

. 0

MONA

LATHES Lodge & Shipley 16"x6 & 8" Jones & Lamson, 3x36 Dble. Spdle.

MILLS

Lees Bradner No. 3 Internal Thread Craftsman Rotary No. 1, 2 6 3

PRESSES

No. 94 Bliss, Solid Back No. P 3 6 4, 6 P G 2 Fer., Solid Back No. 34 Toledo Solid Back, Geared

PLANERS

Bedford, 39"x13' Openside, 1 Rail & 1 Side

SQUARING SHEARS

Ohl 10'x3/16" M.D. TAPPERS

No. 1, 2 & 2X Garvin & Spdl. Holmes Tilted No. 3 5 Spdl. Webster & Perks Vertical

OTT MACHINERY SALES, Inc. DETROIT, MICHIGAN

548 Second Ave.

EMERMAN HAS IT -NEED IT ? MACHINES DRILLS LATHES FOR CERTAIN SHAPERS PRESSES SLOTTERS GRINDERS T THREAD MILLS **BORING MACHINES** SCREW MACHINES BROACHING MACHINES MILLING MACHINES HIGH PRODUCTION EOUIP MDNA LOUIC E EMEDM

1761 ELSTON AVE.-

CHICAGO, ILL.

AVAILABLE!

REBUILT-Ready to Ship

ment LATHES

13"x8" Flother 24"x14" Reed—chuck 24"x18" Titchburg H.D. Vulcen Prod. M.D. Front & Bear Slides, cap. 5"x18"—Semi-auto—never used MILLS

MILLS
No. 3 Becker Vertical, M.D.
No. 0 Brown 6 Sharps, Picin, M.D.
No. 0 Gwens, Picin, M.D.
Model B Becker Vertical Rotary Mill—
table 25" dia. M.D.
2—45" Oesteriein Offset Millers Fine cond.

M.D. 3" Bar Miles Bement Horizontal Boring-Knee type 24" Bullard Type Vert. Boring and Turret

4" Bar Niles Horisontal Boring—Knee type 76" feed to bar Newton Keyseating with vertical spindle MISCELLANEOUS

MISCELLANEOUS
No. 58 National Acme 4 spindle Automatic M.D. Collets. Top Turning Slide. Threading Spindle
No. 3 New Britain 6 spindle Automatic Chucking Machine (like No. 554) M.D. with automatic collets, no chucks
Vertical Boring Mill—I head on rail—Home-made machine. Well built. Good for rough work

Home-made machine. Well built. Good for rough work
No. 6 Bryant Internal Grinder
30" Morton Draw Cut Shaper
No. 24 Foote Burt H.D. Drill S.P.D.
21" Cincinnati Super Speed Drill M.D.
1, 2, spindle Leland 6 Gifford Drills
1/2" National Bent Tapper
15":55" Landis Plain Grinder—self-cont.
3—71/2HP Bridgeport Snagging Grinders
8 ton American Vert. rack 6 pinion Broach
Hendey Single End Centering Machine
No. 2 Mitts 6 Merrill Keysectler
35" dia. Bellevus cil tempering furnace
16" Portable Elevator

Our Engineering Service will aid in the Selection of Good Used Production Machines Now Available.

R. A. VINE'S MACHINERY WAREHOUSE

652 West Willis Avenue

Detroit, Michigan

IMMEDIATE DELIVERY

10,000 New Steel Stacking Boxes



Baxes Stacked 3 Hinh

estructed

\$1.75 each, F.O.B. Chicago

24"x15"x7%-17 gauge. Drop handles both ends. Lots of 25 or more.

PASSMAN BROTHERS

1101 W. Lake St., Chicago, III. New Britain - Gridley 4 sp., Automatic Chucker, M.D., late type

34" Gridleys, Mod. F 4 sp., with threading att., S.P.D. (10)

1" Cone, 4 sp., M.D., threading att. old style (2)

No. 55 Acmes, 4 sp., S.P.D. 1%" cap. (2)

2¼" Cleveland, S.S., belt drive

TRIPLEX MACHINE CO.

117 Fourth Street Pittsfield, Mass.

GRINDERS

8x14 Van Norman M.D. 8x14 Van Norman M.D.
No. 11/2 Cinc. Univ., T & C.
Complete
12"x36" —P.F. Bath Univ.
10x72 Norton, P.F. Complete
No. 55 Heald Int. Complete
No. 6 Gardner Disc, Univ.

LATHES

MILLING MACHINES
No. 0 Kempsmith M.D.
No. 0 Chicago with Vert. At.
No. 10 Pratt & Whitney
No. 31/2 Fox Plain, P.F.
No. 2 Becker-Brainard, Pl.
No. 7H Becker, Prod. Type
56"x12" Becker, Prod. Type
12" Memerican Shaper B.G.
56"x12" Becker, Prod. Type
12" Age of Shaper B.G.
18" Memory B.G.
19" American Shaper B.G. 2" Becker, Prod. MISCELLANEOUS

2 Mitts & Merril Keyst. 10x10 Napier Metal Bandsw. 15x6 Bradford T.A.

16x8 Sidney, dble. b.g.
16x12 American, M.D. T.A.
20x15 Boye-Emmes T.A. MD.

24 spdl. P. & N. Multiple

all motor driven



30 S. Clinton St., Chicago

IMMEDIATE DELIVERY

48" Bement-Miles vert. Boring Mill 42" Power Shear, 1/4" cap. 36" vertical Boring Mill

GILMORE MACHINERY CO.,

00"x42"x15' Patch 4 head planer 42"x42"x15' Bedford 2 hd. openside planer

No. 2 Becker Vertical Mill

No. 1 Adams Gear Hobber

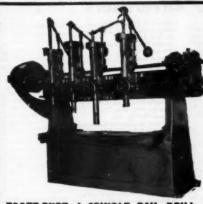
No. 3 B. & S. 26" Gear Cutter 26"x16' Niles Lathe

Shaper, 7", 12", 16", 20" and 24"

UNIVERSAL MACHINERY CO.

1046 W. Van Buren St.,

Chicago



N.B.P. 5' Rad. Drill, Univ. Arm, SPD. Bausch 12 Spindle Drill, 36" dia.— 11" capacity Bausch 8 Spindle Drill, 33" dia.— Foote-Burt 4 Spindle Rail Drill, No. 4 M. T.
Libby Type "C" Turret Laths, 28"—
7½" hole, M.D.
Gisholt 24" Turret Lathe—6½" hole
N.B.P. 24"x10" Lathe, Cone Head, Prentice 16"x12" Lathe, Cone Head, D.B.G. Fay Automatic for Bovel Gears Pay Automatic for Sevel Gears
Drois & Krump No. 353—4'—10
Gauge Press Brake, M.D.
V & O No. 2½ O.B.I. Press, M.D.
Becker No. 6 Vertical Miller, M.D.
Sundstrand No. 5—48" Rigid Mill,
M.D.

Sellers 3" Horiz. Bor. & Drilling Mch. Oliver No. 6 Drill Grinder Niles 52" Boring Mill, 2 swivel heads Steptoe 14" Shaper Pexto 10'-18 ga. cap., Power Shear Rock River No. 5 Buildezer

FOOTE-BURT 4 SPINDLE RAIL DRILL. Spindles 3" diameter No. 4 Morse taper, spindle travel 12", 5 spindle speeds, 8 spindle feeds, 3 step cone drive.

128 S. CLINTON ST. ACME EQUIPMENT CO., CHICAGO, ILL.

GOOD TOOLS? — SEE US FIRST

D-31 Fox multiple drill, rectangular head, 16"x311/2" spindle centers. No. 2 Morse taper; 10 spindles, hand and power feed to head.

DIES and MACHINES for rect. cans, inc. 61 Ams flanger: 72 Ams double seamer; 126CD Adriance double seamer; 281 Adriance gang slitter; No. 114 Adriance Automatic Double Seamer 10" round cons.

DRILLS, 2 Sp. Mason 10,000 R.P.M.; Detroit 5 Sp. Horizontal: No. 4 Quint six spindle turret drill; No. 4 Morse tapers

HAMMER, 60 lb. Bradley Helve

ENGINE LATHES, 20"x8 Reed D.C., Motor WIRE STRAIGHTENER, %" Wells 4 ft.

MILLING MACHINES, No. 1 Newton slab, 65" table feed

PLANERS, 24"x6' Pond, one head

PIPE MACHINES, 3" Bignall & Keeler: 4" Saunders; both belt drive.

PRESSES, One No. 40 Bliss horn

SAND BLAST, Panaborn 30x38 Barrel

SEPARATOR, McKingle chip production

Many other tools-exceptional "buys"-write for full details.

A. D. White Mchy. Co., 108 N. Jefferson St., Chicago, Ill.

Established 1894

EPTEMBER 1942

Index To Advertisers

Accor Machinery Co. A. 1855	Brown & Sharpe Mfg. Co
Aaron Machinery Co. 353 Abrasive Dressing Tool Co. 150 Aeme Diamond Tool Co. 276 Aeme Equipment Company 399	Bryant Chucking Grinder Co. 75
Asma Dismond Tool Co	Buffaio Forge Co.
Acme Equipment Company	Burke Machine Tool Co
Acme Industrial Co. 331	Burns Mchy. Co., F. W. 370
Aeme Industrial Co. 331 Aeme Tool Co. 275 Aeromark Corp. 276	Barr & Son, J. T. 307
Aeme Tool Co. 275 Aeromark Corp. 276 Aget-Detroit Mig. Co. 322-349 Ahlberg Bearing Co. 135 Airway Pump & Equipment Co. 297 Ajax Engra, & Mig. Co. 109-321 Alle Co. 109-321 Alle Tool Company 237 Allegheny-Ludlum Steel Corp. 13 Allied Machinery Co. 386 Almond Mig. Co., T. R. 271 American Brooch & Machine Co. 91 American Diamond Tool & Gage Co. 243 American Saw & Mig. Co. 262	Busch Co., J. C
Aget-Detroit Mig. Co. 322-349	
Ahlberg Bearing Co. 135	
Aircraft Mehy, Corn. 263	0 7 0 0
Airway Pump & Equipment Co. 297	C. W. C. Corp. 340 Campbell's Creek B. R. Co. 354
Ainx Engrg. & Mfg. Co. 109-321	Campbell's Creek R. R. Co. 355 Canedy-Otto Mig. Co. 220 Cappowell Mig. Co. 122 Capitol Machinery Exchange 355 Carbide Fabricators 325 Cardinal Machiner Co. 325
Alco Tool Company 237	Canada Mig. Co
Allegheny-Ludium Steel Corp. 13	Carled Marking Co. 120
Allen, Alva F. 152	Cartill Fabricary Exchange
Allied Machinery Co. 388	Carbine Papricators 325
Almond Mfg. Co., T. R. 271	Cardinal Machine Co. 234
American Broach & Machine Co. 91	
American Diamond Tool & Gage Co. 243	Central Taral Co. 283
American Metal Works 277	Come de Posses Comments and 327
American Saw & Mfg. Co. 262	Challenge Machinery Carp. 283
American Saw & Míg. Co. 262 American Society for Metals 347	Chicago Die Costina Mc C
American Tool Salvage Corp. 358	Chicago Mfg. & Diet. Co. 272
American Tool Salvage Corp. 358 Ames Corp. B. C. 83 Anderson Bros. Mfg. Co. 251 Anderson & Brown Co. 33 Anker-Holth Mfg. Co. 111	Catikill Metal Works
Anderson Bros. Mfg. Co. 251	Chicago Rivet & Machine Co
Anderson & Bruwn Co. 33	Chicago Wheel & Mr. Co.
Anker-Holth Mfg. Co. 111	Cincinneti Floriscal Tool Co
Anker-Hoth Mig. Co. 111 Armstrong - Blum Mig. Co. Inside Front Cover Armstrong Brox Fool Co. 307	Cincinnati Crinden Inc
Armstrong Bray & Co. 307	Cincinnati Machinery & Smooth Co.
Armstrong Bros. Teol Co. 4 Arter Grinding Machine Co. 131 Atlantic Mehry, Corp. 255-280	Cincinnati Milling Machine Co. 372
Arter Grinding Machine Co. 131	Cincinnati Tool Co.
Atlantic Mchry. Corp. 255-280	Circle Tip Tool Co.
	Circle Tip Tool Co. 334 Clements Mfg. Co. 302 Cleveland Twist Drill Co. 32D-205
Atlantic Saw Mfg. Co. 269	Cleveland Twist Daill Co. 2007
Attas Equipment Co. 282	Climax Molybdenum Co. 225
Atlas Press Co. 32	
Auburn Metal Products Co. 354	Colwell, Co., S. G. 140
	Comet Tools, Inc. 260
Auto Moulding & Mfg. Co. 328	Comtor Company
Auto Ordnance Corp. 38-39	Comtor Company 140 Cone Automatic Machine Co. 125 Continental Machines, Inc. 10-11
Automotive Maintenance Mehy. Co	Continental Machines, Inc.
Auto Moulding & Mig. Co. 332 Auto Moulding & Mig. Co. 328 Auto Ordnance Corp. 38-39 Automotive Maintenance Mehy. Co. 190 Avery Adhesive 341 Avey Drilling Machine Co. 155	Conway Chutch Co. 10-11
Avey Drilling Machine Co. 155	Cooley Flee, Mfr. Corp.
	Coulter Machine Co., James
	Cavel Manufacturing Co.
Bakewell Mfg. Co. 151	Criterion Machine Works
Bakewell Mfg. Co. 151	Culten-Friestedt Co. 308
Bancheck Machinery Corp. 351	Cullman Huber Sales Co. 972
Borron Machinery Co.	Callman Wheel Co. Back Cores
Bartalt Engre. Co.	Continental Machines, Inc. 10-11
Barrett Engrg. Co. F. A. 900	
Baldor Electric Co. 331	D
Bennett & Rafkin Co. 364	
Berkeley Equipment Co. 176	Daniels, C. R. 357 Danly Machine Specialties 90 Darnell Corp., Ltd. 244 Davis Boring Tool Div. 314 Davis Mely, Co. 353 Deam Mchry, Co., R. S. 374 Dearborn, J. W. 349 Dearborn Gage Company 165 Delta Manufacturing Co. 24
Bernstein & Co., Geo. M. 370	Darnell Corn. Ltd.
Bernstein & Co., Geo. M. 379 Besly & Company, Chas. H. 163	Davis Roring Tool Div.
Beverly Shear Co. 271	Davis Mahy Co. 310
	Deen Mehry, Co. II S
Blake Co., Edward	Dearborn, I. W. 374
Blanchard Machine Company 168	Dearborn Gage Company
Blank & Buxton Machinery Co. 50	Destrorn Gage Company 165
Boice-Crane Co. 42	DeSanno & San. A. P.
Betwinik Brothers	Desmand Stephen Mfr. Co. 99
Brady-Penrod, Inc. 213,257	Desmond-Stephan Mfg. Co. 257 Detroit Power Serewdriver Co. 285
Brand Tool & Supply Co. 214	Detroit Universal Duplicator Co. 285
Bremil Mfg. Co. 318	Detroit Universal Duplicator Co. 79 Detterbeck Co., Geo. L. 218
Breuer Electric Company 256	DeWitt Tool Company
Black Drill Company 339 Blake Co., Edward 227 Blanchard Machine Company 168 Blank & Buxton Machinery Co. 50 Bolec-Crane Co. 42 Botwinik Brothers 374 Brady-Feurod, Inc. 213-257 Brand Tool & Supply Co. 214 Bremil Mg. Co. 318 Breuer Electric Company 256 Brewiter-Squires Company 328 Brewiter-Squires Company 328	
Bridgeport Machines, Inc. 127	Diamond Tool Co. 215
	Die Sunniv Co.
Bridgeport Safety Emery Wheel Co. 240	205
Bridgeport Safety Emery Wheel Co. 240 Brooks Co., B. D. 358	DoAll Company, Inc.
Bridgeport Safety Emery Wheel Co. 240 Brooks Co., B. D. 358 Brown Corp., W. R. 294	Donberg & Danits
Bridgeport Safety Emery Wheel Co. 240 Brooks Co., B. D. 358 Brown Corp., W. R. 296 Brown Engineering Co. 242.258	Doall Company, Ise. 26 Donberg & Danits 365-384 Dony Machinery Co., D. F.
Sewester Sector Company 328	212

-

电压电阻电阻电阻电阻电阻

Ha Ha Ha Ha Ha

Drive-All Mfg. Ce.	204	Harvey Mfg. Corp.	275
Drive-All Mfg. Ce. Durant Mfg. Co. Dura Machine Tools	269	Harvey Mfg. Corp. Haskins Company, R. G. Hassall, Inc., John	123
Duru Machine Tools	319	Hassall, Inc., John	261
Dykem Co.	248	Heimann Mfg, Co.	88
		Heller Bros.	31
*E		Heller Bros. Hevi-Duty Electric Co. Hevi-Duty Electric Co. Hill-Clarke Machinery Co. His-Cy-Wolf Machine Co. Hobart Brothers Co. Hotel Philadelphian Howe & Son, Inc.	159
E & N Mfg. Co. East Shore Machine Products Co.	291	Hill-Clarke Machinery Co377-	390
East Shore Machine Products Co.	306	Hisey-Wolf Machine Co.	41
Eastern Engineering Co. Eastern Machinery Co. 362 Economy Machine Products Co.	118	Hebart Brothers Co.	1
Eastern Machinery Co	1-303	Hotel Philadelphian	256
Fisher Engineering Co. Inc.	290	Howe & Son, Inc.	336
Eleler Engineering Co., Inc.	154	Huebech, N. L. Hyman & Sons, Joseph	356
Elgin Tool Works Elmes Engrg. Works, Chas. F.	97	aryman & Joseph	999
Elyria Belting & Machinery Co.	354		
Emerman & Co., Louis E.	397	Mari Communication December Co.	***
Ensign Prod. Co.	246	Illinois Testing Laboratories Inc.	230
Elyria Belting & Machinery Co. Emerman & Co., Louis E. Ensign Prod. Co. Errington Mechanical Laboratory Easley Machinery Co. E. L.	265	Ideal Commutator Dresser Co. Illinois Testing Laboratories, Inc. Indianapolis Machinery & Supply Co360	301
Extension mechanical Laboratory Easley Machinery Co., E. L. Etteo Tool Co. *Eutectic Welding Alloys, Inc. Evans Flexible Reamer Co.	396	Industrial Diamond Co.	47
Etteo Tool Co.	289	Industrial Diamond Co. Inland Machinery Co. International Mctyr, Co. International Mctyr, Co. Interstate Machinery Co. 366	304
* Eutectic Welding Alloys, Inc.	312	International Mehry, Co.	393
Evans Flexible Reamer Co.	307	Interstate Machinery Co. 366	-367
Ex-Cell-O Corp.	115	***************************************	
* Excelsior Tool & Machine Co.	172	1	
Ex-Cell-O Corp. « Excelsior Tool & Machine Co. Experimental Tool & Die Company	313	Jackson Machine & Tool Co.	286
		Janette Manufacturing Co.	311
F. & M. Sales Company Factory & Mill Supply Co., Inc. Fallor-Strafer Machinery Co.	174	Janette Manufacturing Co. Jarvis Co., Chas. L.	15
Factory & Mill Sannly Co., Inc.	354		
Failor-Strafer Machinery Co.	356	Johnson one Appriance Co.	200
Falk Mill Supply Co.	385	Johnson Machine & Fress Corp.	1393
Federal Foundry Supply Co.	182	Johnson Mfg. Corp.	49
Vederal Press Co.	345	Johnson Mfg. Corp. Johnson & Sons Mchy. Co., Wm. C274	-354
Falk Mill Supply Co. Federal Foundry Supply Co. Federal Frent Co. Fell Co., Wm. B. Fell Co., Wm. B. Fellows Cear Shaper Co. Field Abrasive Specialty Mfg. Co. Fisher Tool Co.	210		
Fellows Gear Shaper Co.	113	Jones Machine Tool Co. Jurzek Machine & Engrg. Co.	357
Field Abrasive Specialty Mfg. Co.	312	Jurzek Machine & Engrg. Co.	342
¿ Fisher Tool Co.	261		
Foster Machinery Co.	354	V O Besteville	-
Fray Machine Tool Co. Front	Cover	K-O Products Co.	326
Fisher Tool Co. Foster Machinery Co. Fray Machine Tool Co. Frye Machine Tool Co. Frye Machine Tool Co. Fulfio Specialties Co.	376	Kamis Eng. Co. Karelsen, Inc., E.	970
rumo Specialities Co	. 32	Kearney & Trecker Corp.	80
		Kempsmith Machine Co.	45
Galland-Henning Mfg. Co. Galbreath Mohy. Co. Gallmeyer & Livingston Co. Gardner Machine Co. Gaston Power Tools Co.	171		
Galbreath Mehy, Co.	368	Keyatone Engrg. Co. Kirk & Blum Mfg. Co. Klauber Machinery Co., E. L. Knight Machinery Co., W. B. Koebel Diamond Tool Co. Kopec Engrg. Co., S. J.	355
Gallmeyer & Livingston Co. Inside Back (COVER	Kirk & Blum Mfg. Co.	34
Gardner Machine Co.	161	Klauber Machinery Co., E. L.	359
Gaston Power Tools Co.	299	Knight Machinery Co., W. B.	95
General Blower Co.	387	Koebel Diamond Tool Co.	276
General Eng. & Mfg. Co.	174	Kopec Engrg. Co., S. J.	185
George Mchy. Co., James W.	359		
Gilmore & Co., F. F.	277		
Gilmore Mchy. Co.	398	L. & J. Press Corp.	230
Giron Products Co.	251	L-W Chuck Co.	201
Gaston Power Tools Co. General Blower Co. George Mely. Co., James W. Gilmore & Co., F. F. Gilmore Mely. Co. "Gilron Products Co. "Gilron Brothers Mfg. Co. Glvan Machinery Co. "Glenser Co., J. C. Globe Machinery Co.	291	L-W Chuek Co. Lafayette Machinery Corp. Lake Machinery Co. Lang Machinery Co. Langens Bros.	393
t Clanest Co. T. C	149	Land Machinery Co.	389
Globe Machinery Co.	353	Laurena Bros.	391
		ACRES CAR APT UPS	344
Goldman & Co., Rarrer	370	Lazak Mehry, Co., H.	
Goldman & Co., Harvey	370	LeBland Mch. Tool Co., R. K.	77
Goldman & Co., Harvey & Gorton Machine Co., Geo. Graham Machine Tool Co.	370 121 387	Leach Mehry, Co., H. LeBlond Mch. Tool Co., R. K.	77
Goldman & Co., Harvey & Gorton Machine Co., Geo. Graham Machine Tool Co.	370 121 387	Leach Mehry, Co., H. LeBlond Mch. Tool Co., R. K. Lee Co., K. O. Lempeo Prod. Inc.	77 264 175
Goldman & Co., Harvey + Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mfg. Company - Cranic Stein Machine Co.	370 121 387 180	Laurens Bros. Leach Mehry. Co., H. LeBlond Mch. Tool Co., R. K. Lee Co., K. O. Lempce Prod. Inc. Leslie Welding Co.	77 264 175 218
Goldman & Co., Harvey + Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mfg. Company - Cranic Stein Machine Co.	370 121 387 180	Leach Mehry, Co., H. LeBlond Mch. Tool Co., R. K. Lee Co., K. O. Lempce Prod. Inc. Leslie Welding Co. Lewis Machine Tool Co.	77 264 175 218 349
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Michine Tool Co., Graham Mig. Company. Granite State Machine Co., Grans Mig. & Machine Co., Grans Mig. & Machine Co.	370 121 387 180 256 238	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H.	349
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Granite State Machine Co. Granite State Machine Co. Grent Mig. & Machine Co. Grenerd Arbor Press Co., Grent Manufacturing Co.	370 121 387 180 256 238 323 288	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works	349 236 24
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Granite State Machine Co. Granite State Machine Co. Grent Mig. & Machine Co. Grenerd Arbor Press Co., Grent Manufacturing Co.	370 121 387 180 256 238 323 288	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co.	349 236 24 233
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Michine Tool Co., Graham Mig. Company. Granite State Machine Co., Grans Mig. & Machine Co., Grans Mig. & Machine Co.	370 121 387 180 256 238 323 288	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company	349 236 24 233 71
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Grants State Machine Co. Grants State Machine Co. Grenerd Arbor Press Co., Greenby Manufacturing Co. Grob Brothers. Grob Brothers. Grobet File Co. of Am. 304	370 121 387 180 256 238 323 288 254	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company	349 236 24 233 71
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Grants State Machine Co. Grants State Machine Co. Grenerd Arbor Press Co., Greenby Manufacturing Co. Grob Brothers. Grob Brothers. Grobet File Co. of Am. 304	370 121 387 180 256 238 323 288 254	Lewis Machine Tool Co., Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company Linley Brothers Littal Machine Co. E. I.	349 236 24 233 71 238 138
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Grants State Machine Co. Grants State Machine Co. Grenerd Arbor Press Co., Greenby Manufacturing Co. Grob Brothers. Grob Brothers. Grobet File Co. of Am. 304	370 121 387 180 256 238 323 288 254	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company Linley Brothers Little II Machine Co., F. J. Logan Engineering Co.	349 236 24 233 71 238 138
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Grants State Machine Co. Grants State Machine Co. Grenerd Arbor Press Co., Greenby Manufacturing Co. Grob Brothers. Grob Brothers. Grobet File Co. of Am. 304	370 121 387 180 256 238 323 288 254	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company Linley Brothers Littell Machine Co., F. J. Logan Engineering Co. Lombard Governor Corp.	349 236 24 233 71 238 138 12 122
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Grant Mig. Company. Grant Mig. & Machine Co. Grenerd Arbor Press Co. Greenly Manufacturing Co. Grob Brothers. Grobet File Co. of Am. 304	370 121 387 180 256 238 323 288 254	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company Linley Brothers Littell Machine Co., F. J. Logan Engineering Co. Lombard Governor Corp.	349 236 24 233 71 238 138 12 122
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Grants State Machine Co. Grente State Machine Co. Grente State Machine Co. Grente Arbor Press Co., Greenly Manufacturing Co. Grob Brothers. Grob Brothers. Grob Brothers. Haleo Products Co., Hamilton Tool Co., The Hammond Machinery Builders. Hammin Mig. Co.	370 121 387 180 256 238 323 288 254 305	Lewis Machine Tool Co. Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Motor Co. Lincoln Electric Company Linley Brothers Littell Machine Co., F. J. Logan Engineering Co. Lombard Governor Corp.	349 236 24 233 71 238 138 12 122
Goldman & Co., Harvey. Gorton Machine Co., Geo. Graham Machine Tool Co. Graham Mig. Company. Granite State Machine Co. Granite State Machine Co. Grent Mig. & Machine Co. Grenerd Arbor Press Co., Grent Manufacturing Co.	370 121 387 180 256 238 323 288 254 305	Lewis Machine Tool Co., Lewthwaite Machine Co., T. H. Liberty Tool & Gage Works Lima Electric Company Lincoln Electric Company Linley Brothers Litteil Machine Co., F. J. Logan Engineering Co. Lombard Governor Corp. Lombard Manufacturing Co. Long Machinery Co., Lucas & Son, Inc., J. L., Luna Electric Evaniument Co.	349 236 24 233 71 238 138 12 122

M		Progressive Tool & Cutter Co.	329
M-B Products Co.	287	Progressive Welder Co. Prutton Mehry. & Tool Co., D. H.	181
M-B Products Co. McDonald Machinery Co. McGill Mfg. Co. McKenna Metals Co.	371	Prutten Mehry. & Tool Co., D. H.	354
McGill Mrg. Co.	317		
Machine Products Com	197	. 0	
McKenna Metals Co. Machine Products Corp. Machinery Mg. Co. 183	-305	Queen City Machine Tool Co.	116
Madison-Kipp Corp. Majestic Tool & Mig. Co. Maleo Machinery Co.	298	•	
Majestic Tool & Mfg. Co.	253	_	
Maleo Machinery Co.	286	R	
Mail Tool Company Marshalltown Mfg. Co.	206	R & L Tools	44
Master Electric Co.	287	Reading Machine Co.	100
Matson Machinery Sales	354	Reading Machine Co. Reconstruction Machine Tool Co.	380
Master Electric Co. Maston Machinery Sales Meyers Company, W. F. Midwest Tool & Eng. Co. Midwest Tool & Mig. Co.	279		
Midwest Tool & Mfg. Co.	144	Reeves Pulley Co.	173
Miles Machinery Co. Millers Falls Co. Modern Collet & Machine Co. Modern Machine Corp.	381	Reevee-Fritte Co., The Reevee Pulley Co. Regar Mchy. & Mill Supply, S. M. Reliance Machinery Sales Co. Remeo Products Corp. Rhode Island Tool Co. Richards Co., J. A. Rivett Lathe & Grinder, Inc. Robbins Engrs. Co.	357
Millers Falle Co.	147	Remeo Products Corp.	132
Modern Collet & Machine Co.	358	Rhode Island Tool Co.	281
Modern Machine Corp.	278	Richards Co., J. A.	319
Modern Tools Modern Tool Works Mohr Lino-Saw Co.	139	Rivett Lathe & Grinder, Inc.	53
Mohr Lino-Saw Co.	230		
Mohr Lino-Saw Co. Morey Machinery Co., Inc. 235-309-323	-378	Robertson & Co., F. H. Rogers & Co., Sanl. C. Rogers Machine Works Sees Co., David J. Ross Operating Valve Co. Rotory File Co. Rotor Tool Co. Rotor & Co., H. B. Russell Machine Co. Ruthman Machinery Co. Ryerson & Son, Inc., Jos. T.	289
Marin Machine Tool Sales	368	Rogers Machine Works5	8-59
Moslo Machinery Co.	180	Ross Co., David J.	292
Moslo Machinery Co. Motor Sales & Service Co. Motor Tool Mig. Co. Murphy & Co., James A.	359	Rotary File Co.	330
Motor Tool Mfg. Co.	222	Rotor Tool Co.	17
Murphy & Co., James A.	254	Rouse & Co., H. B.	188
		Russell Machine Co.	356
N		Ruthman Machinery Co.	64
National Arme Co.	117	myerson or pont sucot ton we were seen and	
New Britain Tool & Mig Co.	337		
New Method Steel Stamps, Inc.	248	8	
National Aeme Co. New Britain Tool & Mig Co. New Method Steel Stamps, Inc. New Plastic Corp. Nicholo & Sons, W. H. Nicholon & Co., W. H. Nicholon File Co.	57	S. & S. Machinery Co	373
Nicholson & Co., W. H.	252	Sar War Tool & Machining Co.	132
Nicholson File Co.	69		
Nielsen, Inc. Nielsen Tool & Die Co. Nilson Machine Co., A. II. 294	258	Scherr Co., George Schmidt Inc., Geo. T.	104
Nilson Machine Co. A. W. 294	295	Schmidt Inc., Geo. T.	327
Nobur Mfg. Co.	93	Scott Machinery Sales	393
Nilson Machine Co., A. H	351	Segal Machinery Co. Seneca Falls Machine Co.	178
North Machine Tool Co.	350		
Norwood Engre. Co.	85	Shelden Machine Co.	390
Numberall Stamp & Tool Co.	304	Simmone Machine Tool Corp. 2	0.21
Nutmeg State Mchy. Corp.	354	Siegman Machinery Co. Simmone Machine Tool Corp. 2 Skilaaw, Inc.	60
0		Smith Tool Works Smith Power Transmission Co	244
O'Brien Machinery Co	395		
Oliver Instrument Co. O'Neil-Irwin Manufacturing Co.	279	Sossner Tool Co.	284
O'Neil-Irwin Manufacturing Co.	216	South Bend Lathe Works	62
Osburne & Sexton Machinery Co. Osburd Tool & Die Co.	340	Sommer Tool Co. South Bend Lathe Works Southwest Mfg. Co. Springfield Machine Tool Co. Stackbin Corporation	128
Ott Machinery Sales, Inc.	396	Stackbin Corporation	301.
		Cindon Mile Co.	200
		Standard Electrical Tool Co.	285
Paddock Tool Co.	251	Standard Electrical Tool Co. Standard Machinery Co. Standard Transmission Equip. Co. Star Machine & Eng. Corp. Steege Machinery Co., W. L. Steege Machinery Co., W. L. Stow Manufacturing Co. Strong, Carlisle & Hammond Go. Stardimatic Tool Co. Startery Co., P. A. Sun Machinery Co. Sun Oil Co.	266
Passman Brothers Pels Mehy. Co., H. H. Pince Engrg. Company Plunket Machine Co., J. E.	398	Star Machine & Eng. Corp.	304
Pels Mchy. Co., H. H.	392	Steege Machinery Co., W. L. 270	-361,
Pines Engrg. Company	310	Stow Manufacturing Co.	200
		Sturdimatic Tool Co.	177
Portman Machine Tool Co.	279	Sturtevant Co., P. A. 32B	.32C
Pract & Whitney	102	Sun Machinery Co.	388
Precision Tool Co.	396	Sun Oil Co. Sundstrand Machine Tool Co.	119
Prognaier Safety Chuck Co.	23	Sunnen Products Co.	189
Precision Tool Co. Prints Electric Co. Procunier Safety Chuck Co. Production Machine Co. Production Machine Co.	335	Sunnen Products Co. Super Tool Co.	101
		Superior Mfg. Co. Surplus Tool Exchange	354
Products Engineering Co.	310	Surplus Tool Exchange	359

	Vimco manuscruring Co.	. 200
T. & H. Mfg. Co. 248	Vine, R. A.	397
Tamma Silien Co. 130		
Tannewitz Works 348	***	
Tatra Tool Co. 295	W	
Taylor Machine Co. 209	Wade Tool Company	308
Threadwell Tap & Die Co. 112	Walker-Turner Co	46
Timesaver Products Co. 403	Wall-Colmonov Corp.	- 3 4 3
Tomkins-Johnson Co. 192	Walls Sales Corporation	212
Topeka Foundry & Iron Works 247	waitham Dial Gage Co.	210
Torit Manufacturing Co. 231	Walton Co.	240
Torq Electric Mfg. Co	Wardwell Mfg. Co.	306
Travers Tool Co. 376	wesen immustres inc.	. 00
Tri Machine & Tool Co. 354	Weldex, Inc.	170
Trico Fuse Mfg. Co. 238	Wendt-Sonia Co.	293
Trindl Products, Ltd. 346	West Penn Machinery Co.	357
Triplex Machine Co	Wheel Trueing Tool Co.	267
Troyke, Alfred A. 268	White Dental Mig. Co., 5, 5,	1.03
Tru-Cut Tool Co. 337	White Machinery Co., A. D.	399
Turner Uni-Drive Co	Whitney Metal Tool Co.	250
Tuthill Pump Co. 146	Wiener Machinery Co.	358
	Wigglesworth Mchy. Co.	392
	wigglesworth menry, to., I. H.	210
	Willey's Carbide Tool Co.	281
U. S. Elec. Tool Co. 247	Wilson, K. R.	51
U. S. Machine Tool Mfg. Corp. 335	Wirth & Son Carl	319
United Precision Products Co. 249	w meeting trear of Engrg., Inc.	aan
Universal Engineering Co. 300-303	Wittek Mfg. Co.	215
Universal High Speed Tool Co. 266	Wysenbeek & Staff, Inc.	153
Universal Machinery Co. 398	***************************************	
Upton Elec. Furnace Div. 14 Used and Rebuilt Machinery 353-399		
Used and Rebuilt Machinery 353-399	Y	
	Yohe Supply Co., Wm. S.	264
V	Yohe Supply Co., Wm. S. Yost Mfg. Co.	306
Vacuum Cup Metal Pulley Co 262		
Van Norman Machine Tool Co. 137	2	
Victor Machinery Co. 375	Zeeve, Alex & Co.	356
Victor Machinery Co. 375 Victor Machinery Exchange 382-383	Zeh & Hahnemann Co.	309

PRECISE FITS - IDEAL LUBRICATION - QUIET OPERATION with TIMESAVER LAPPING COMPOUND



Especially prepared for the fitting and smoothing of gears and bearings in assembled units.

REDUCE COSTS - by eliminating hand scraping and running in operations.

EASY TO USE - Simply mix with oil and apply.

SAFE-Will not charge in-to metal surfaces or continue to cut.

TIME TESTED—Used by leading manufacturers for the past sixteen years.

Grades for ferrous and non-ferrous metals,

Ask for testing samples on your letterhead.

MESAVER PRODUCTS COMPANY 33 S. DESPLAINES ST. CHICAGO, ILL.

×

*

20

ĸ.

,

8

.

4 Ċ

8 9 7



Look into a strong ray of sunlight coming in a window near a grinder or buffer. It's enough to make you forget the law of gravity. Millions of particles of dust and grit from the wheels seem to hang in the air. This dirt flies in every direction, but eventually it comes down to act as a damaging abrasive on machines and human lungs.

The Air Master traps this dangerous dirt the instant it leaves the wheels. A size for every grinder and buffer. Easy to install, easy to clean.

Write today for descriptive literature.



CTRIC DRILLS • GRINDERS • BUFFERS • PORTABLE TOOLS

Cincinnati Electrical Tool Co. DIVISION OF THE R K. LI BLOND MACHINE TOOL CO., CINCINNATI ONIO

2702-9

ADISPENSABLE

for

RODUCTION

No 55-Table speeds up to 125 ft per min.

Working Surface = 12"x36"

iese Grand Rapids Grinders, and others, will enable you meet the demands of the present Defense program.

ey offer you new standards of grinding performance iv production economies and new facilities for improvyour products.

t us send you complete details on these and other RAND RAPIDS GRINDERS

Style "A" - Table speeds up to

Working surface-12"x36" to 24"x72"



GALLMEYER & LIVINGSTON CO.

405 STRAIGHT AVE. S. W.

COAND DADING MICH

[ULLMAN_sprocked

Nearly one half century of specialization in the manufacture of stock sprockets made to detailed specifications, has made CULLMAN a leader in the sprocket field. As a result, we feel well equipped to handle your most complex power transmission problems

Sprockets made to fill special requirements can be produced at low cost and with the highest degree of accuracy. In addition, Cullman stock sprockets can often be adapted for special use by slight inexpensive alterations.

Recommendations will be made and costs given without obligation. of sketches or blueprints.

WRITE FOR BULLETIN-NO OBLIGATION

THE CULLMAN WHEEL CO

1350 West Altgeld Street

Chicago, Illinois

